Chapter 3

Affected Environment, Analysis of Potential Impacts, and Mitigation Measures

FINAL ENVIRONMENTAL IMPACT STATEMENT

CITY OF SHORELINE

Chapter 3—Affected Environment, Analysis of Potential Impacts, and Mitigation Measures

3.1 Land Use Patterns, Plans and Policies

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures for land use patterns, plans, and policies. Information about the intended community character associated with the three action alternatives, including Alternative 4, the Preferred Alternative, is also addressed.

3.1.1 Affected Environment

The analysis of the affected area was completed based on field work in the subarea, as well as review of existing data and information, such as the City of Shoreline Comprehensive Plan and other plans such as the Town Center Subarea Plan (adopted July 2011) and the North City Subarea Plan (adopted July 2001). Applicable elements of the City's Municipal and Development and their relationship to potential action under the subarea plan also have been reviewed.

Station Subarea Context

For development of the 185th Street Station Subarea Plan and environmental analysis purposes, the City of Shoreline Planning Commission determined study area boundaries with consideration of factors such as topography, the ability to walk and bike to and from the station, policy direction from Shoreline City Council, access to arterial streets, opportunity sites, environmental assets, and other existing conditions and influences. The Planning Commission recommended using two sets of boundary lines applicable to these conditions, and the subarea is defined by these combined study area boundaries—one that delineates the study area for land use and another that delineates the study area for mobility (multimodal transportation). These boundaries were adopted by City Council as Ordinance 671 on September 23, 2013. **Figure 3.1-1** illustrates two study areas that together comprise the subarea.

The subarea includes portions of the Echo Lake, Meridian Park, and North City neighborhoods and borders the Ridgecrest neighborhood of Shoreline. Bordering areas include the City of Lake Forest Park to the northeast, which is predominantly single family use (similar to Shoreline), and other incorporated areas of Shoreline to the north, west, and south.

N-NE 185th Street is the most prominent corridor in the subarea, extending from Aurora Avenue (SR 99) at the west boundary of the subarea to 10th Avenue NE at the east boundary of the subarea. The subarea extends approximately one-half mile to the north and south of the 185th corridor. Through a design workshop process, community input shaped the idea of N-NE 185th Street/10th Avenue NE/NE 180th Street as the central connecting

corridor in the subarea between the Town Center District and the North City District.

Traffic Analysis Zones Used for Planning and Analysis

For purposes of population, housing, and employment projections and transportation planning, traffic analysis zone (TAZ) boundaries in proximity to the subarea also have been referenced in this analysis. Because TAZ boundaries align with census tract boundaries, they are commonly used for planning and analysis purposes. Refer to Section 3.2 Population, Housing, and Employment and Section 3.3 Multimodal Transportation for additional information and a map of the TAZ boundaries.

Proposed Sound Transit Light Rail Station Facilities

Through a separate environmental process, Sound Transit identified the potential light rail station location. The preferred option for the station location is north of NE 185th Street on the east side of and immediately adjacent to the Interstate 5 (I-5) corridor. A park-and-ride structure, also to be constructed by Sound Transit, potentially would be located on the west side of I-5, also north of NE 185th Street.

The City of Shoreline supports the station location proposed by Sound Transit, and identifies the location in the City's Comprehensive Plan Land Use Map. **Figure 3.1-2** shows an exhibit from the Lynnwood Link DEIS (published by Sound Transit and the Federal Transit Administration in July 2013). The figure shows a conceptual level plan for the 185th Street Station with possible locations of the station and park-and-ride structure. Figure 3.1-2 is also the preferred conceptual plan identified by Shoreline City Council.

A second light rail station in Shoreline is proposed, with the possible location identified by Sound Transit as just north of NE 145th Street, immediately adjacent to the east side of I-5. The primary connecting routes between the 185th and 145th light rail station subareas include the north-south corridors of 5th Avenue NE , 8th Avenue NE, 10th Avenue NE, and 15th Avenue NE.

Past and Present Land Use Patterns in the Subarea

Past and present land use patterns in the subarea are described below and on the following pages.

History and Settlement of the Area

Early accounts of Shoreline tell how Native Americans traveled along the shores of Puget Sound and local streams collecting swordfern and kinnikinnick at Richmond Beach, and wild cranberries at what are now Ronald Bog and Twin Ponds parks. Controlled fires were set in the Richmond Highlands and North City areas to create meadows for the cultivation of certain wild plants and to provide inviting, open spaces for small game.

In the 1880s, the US Government opened the region to homesteading after railroad fever gripped the Northwest. Speculators planned towns in anticipation of the transcontinental railroad route. Among these was Richmond Beach, platted in 1890. The arrival of the Great Northern Railroad in Richmond

Beach in 1891 spurred the growth of the small town and increased the pace of development in the wooded uplands.

Construction of the Seattle to Everett Interurban trolley line through Shoreline in 1906, and the paving of the North Trunk Road with bricks in 1913, made travel to and from Shoreline easier, increasing suburban growth. People could live on a large lot, raise much of their own food and still be able to take the Interurban, train, or (beginning in 1914) the bus to work or high school in Seattle. Children could attend one of two local elementary schools, and general stores provided most of the goods that could not be grown at home. Local produce from fruit orchards, chicken farms, and strawberry crops was transported via the Interurban or the train. The Fish family's Queen City Poultry Ranch on Greenwood at 159th was a prosperous chicken farm that attracted many visitors. Ronald Station along the trolley line was located near present-day Park at Town Center.

During the early twentieth century, Shoreline attracted large developments drawn by its rural yet accessible location, including the Highlands and Seattle Golf Club (circa 1908). The Firland Tuberculosis Sanitarium (circa 1911), which is now Crista Ministries, also developed during that era. Commercial centers formed around Interurban stops at Ronald (175th Street and Aurora Avenue N) and Richmond Highlands (185th Street and Aurora Avenue N). Car travel facilitated settlement, which increased considerably by the mid-1920s. Although large tracts of land were divided into smaller lots in the 1910s in anticipation of future development, houses were still scattered.

A precursor to Interstate 5, Highway 99 was constructed to stretch from Mexico to Canada, offering more convenient access than ever before to America's new auto travelers. Originally known as the Pacific Highway, but later named Aurora Speedway and Aurora Avenue, there are conflicting histories of the source of the name "Aurora." Some say the name was meant to honor Aurora, Illinois, the hometown of Dr. Edward Kilbourne a Fremont founder. Others say the name recognized the highway as a route north, toward the Aurora Borealis. Regardless of how the highway got its name, it changed the face of the area north of Seattle forever, and as more people took to the road in automobiles, there was less use of the old trolley line. The Interurban made its last run in February of 1939. By the late 1930s and early 1940s, commercial development concentrated along Aurora Avenue, which saw steadily increasing use as part of the region's primary north-south travel route. Traffic on 99 swelled, particularly after the closing of the Interurban.

The Great Depression and World War II (1930-1945) slowed the pace of development. Many Shoreline families managed to live off land they had purchased in better times. During World War II, building materials were rationed and housing construction virtually stopped. The only major development in Shoreline during the war was the Naval Hospital (now Fircrest). At its peak in 1945, the hospital housed over 2,000 patients and 600 staff.

With the end of the war came a substantial demand for family housing. The late 1940s saw large housing developments such as Ridgecrest (NE 165th to 155th Streets, 5th to 10th Avenues NE) spring up seemingly overnight. Schools ran on double shifts as families with young children moved into the new homes. In the late 1940s, business leaders and residents began to see Shoreline

as a unified region rather than scattered settlements concentrated at Interurban stops and railroad accesses.

In 1944, the name "Shoreline" was used for the first time to describe the school district. Coined by a student at the Lake City Elementary School, it defined a community that went from the Seattle city line to Snohomish county line and from the shore of Puget Sound to the shore of Lake Washington.

Shoreline continued to grow, becoming an attractive place to live in the central Puget Sound region due to the great neighborhoods, schools, parks, and other community features. After it became clear that an additional north-south freeway would be needed to handle the cross-state traffic, Interstate 5 was constructed in the 1960s, with the final segment in Washington state opening on May 14, 1969. With its opening, motorists could travel without stopping from the northern California state line to the Canadian border, and Highway 99 became more of a regional route and alternate travel way to Interstate 5. The Interstate 5 corridor bisected the community that had become known as Shoreline, and made east-west travel on local roads more difficult.

Although known as “Shoreline” for decades, the community did not become officially incorporated city until 1995, and prior to that it remained an unincorporated area of King County north of Seattle. Today with 54,790 residents (2013 population), Shoreline is Washington's 15th largest city.

City of Shoreline Historic Preservation Program

The Shoreline community has an interesting historical background, as summarized above . Recognizing this history and the potential for important historical and cultural resources that warrant preservation, the City of Shoreline administers a historic preservation program.

Historic preservation in Shoreline is guided by the Community Design Element Goal CD IV and policies CD38 through CD45 in the Comprehensive Plan, as well as adopted provisions of Title 15.20 of the Shoreline Municipal Code. The preface and purposes of Title 15.20 based on City Council findings are described as follows.

A. The protection, enhancement, perpetuation, and use of buildings, sites, districts, structures and objects of historical, cultural, architectural, engineering, geographic, ethnic and archeological significance located in the city of Shoreline are necessary for the prosperity, civic pride and general welfare of the residents of the city.

B. Such cultural and historic resources are a significant part of the heritage, education and economic base of the city , and the economic, cultural and aesthetic well being of the city cannot be maintained or enhanced by disregarding its heritage and by allowing the unnecessary destruction or defacement of such resources.

C. In the absence of an ordinance encouraging historic preservation and an active program to identify and protect buildings, sites and structures of historical and cultural interest, the City will be unable to ensure present and future generations of residents and visitors a genuine opportunity to appreciate and enjoy the city’s heritage.

D. The purposes of this chapter (15.20 Historic Preservation of the Shoreline Municipal Code) are to:

1. Designate, preserve, protect, enhance, and perpetuate those sites, buildings, districts, structures and objects which reflect significant elements of the city of Shoreline's, county's, state's and nation's cultural, aesthetic, social, economic, political, architectural, ethnic, archaeological, engineering, historic and other heritage;

2. Redesignate two sites in the city of Shoreline, previously designated as historic landmarks by the King County historic preservation commission, as City of Shoreline historic landmarks **(note: because neither of these two sites are in the station subarea, this provision is not applicable)**;

3. Foster civic pride in the beauty and accomplishments of the past;

4. Stabilize and improve the economic values and vitality of landmarks;

5. Protect and enhance the city's tourist industry by promoting heritage-related tourism;

6. Promote the continued use, exhibition and interpretation of significant sites, districts, buildings, structures, and objects for the education, inspiration and welfare of the people of the City of Shoreline;

7. Promote and continue incentives for ownership and utilization of landmarks;

8. Assist, encourage and provide incentives to public and private owners for preservation, restoration, rehabilitation and use of landmark buildings, sites, districts, structures and objects; and

9. Work cooperatively with other jurisdictions to identify, evaluate, and protect historic resources in furtherance of the purposes of this chapter.

Shoreline's Historic Inventory—In review of the historic inventory compiled by the City of Shoreline in 2013, there are twelve properties noted as having the potential for eligibility for landmark designation (although not yet designated) as historic landmarks by Shoreline, which coordinated with the King County Landmarks Preservation Program. These twelve potentially eligible properties include single family lots with houses and structures built from the period of 1916 to 1929. The inventory identifies some of the properties, but not all, including the Russell House, Jersey Summer Homes House, Taylor House, Echo Lake Garden Tracts House, and others. These properties all appear to be privately owned. About half of the potentially eligible properties are located within areas proposed to be rezoned under either Alternatives 2, 3, or 4, and the other half are located outside the proposed rezoning areas. Properties included in the inventory that are potentially eligible for landmark designation may require historic review if alterations or demolition are proposed, but such changes are allowed to inventoried properties.

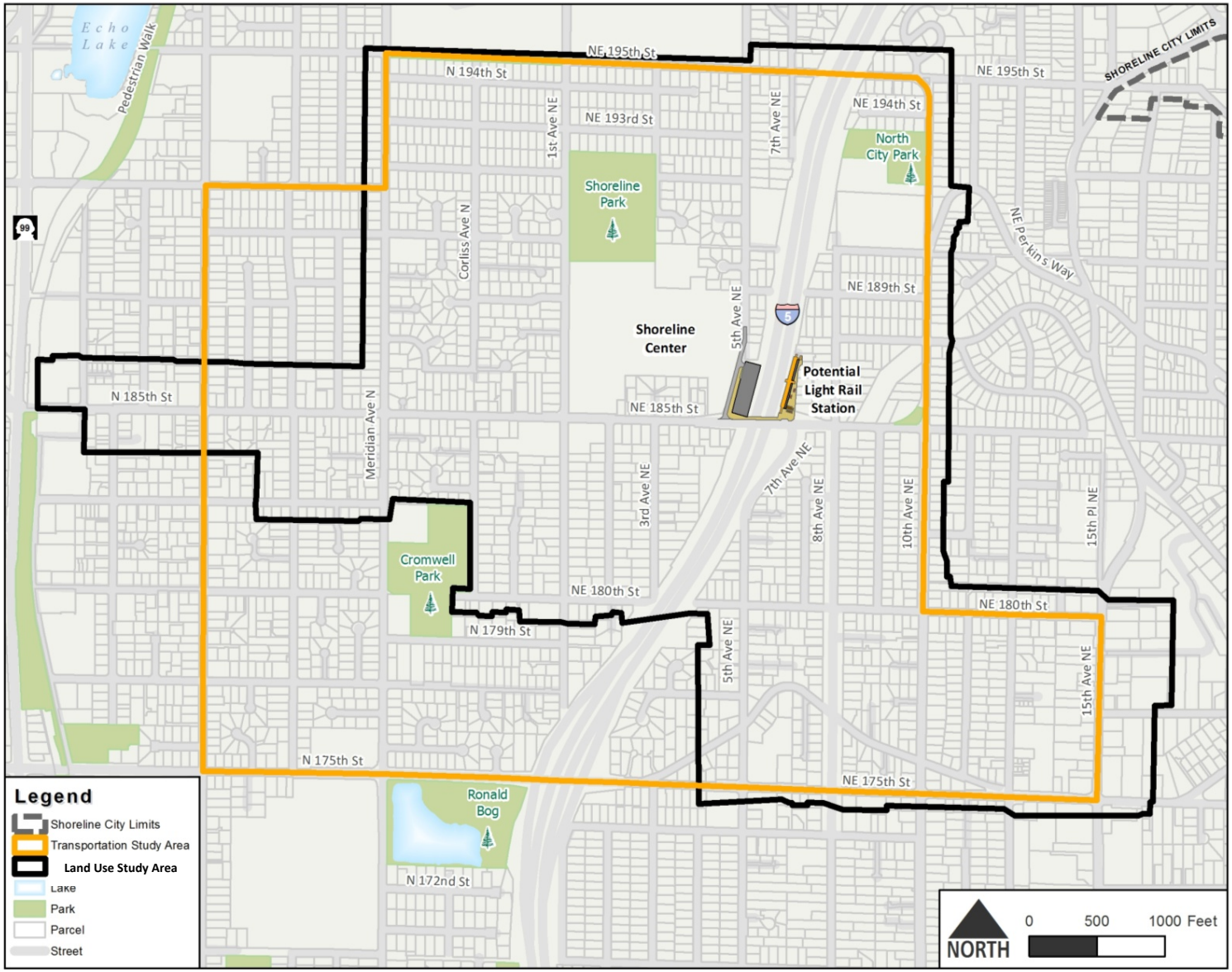


Figure 3.1-1 Land Use (Black) and Mobility (Gold) Study Area Boundaries, which Together Comprise the Subarea

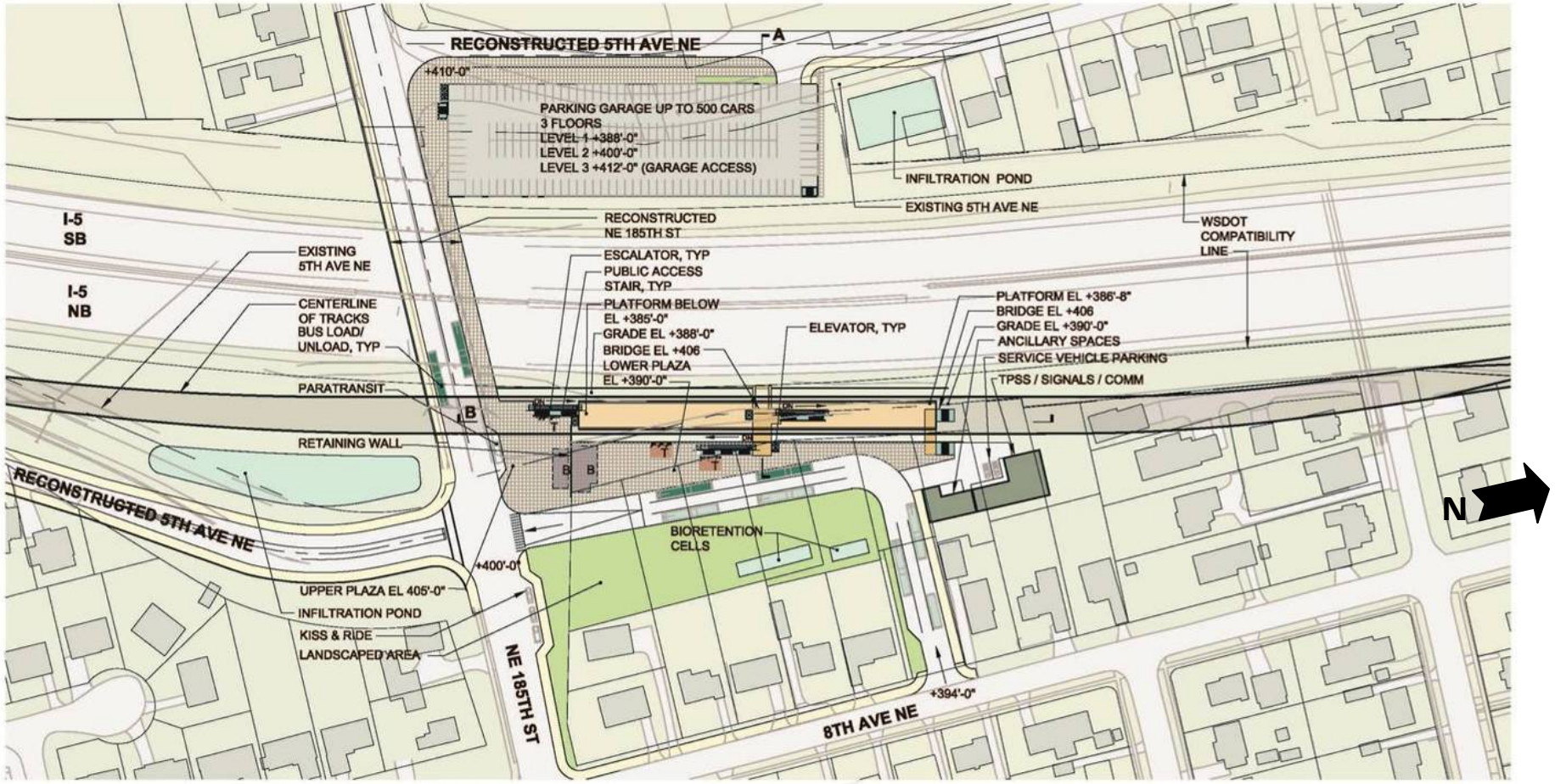


Figure 3.1-2 Sound Transit's Conceptual Design Plan for the 185th Street Station
(Source: Lynnwood Link Extension Draft Environmental Impact Statement, Sound Transit and Federal Transit Administration, July 2013)

More information about Shoreline's Historic Preservation Program as well as community history is available at the following websites/webpages:

- City of Shoreline Historic Preservation http://www.cityofshoreline.com/government/departments/planning-community-development/planning-projects/historic-preservation
- Shoreline Historical Museum http://shorelinehistoricalmuseum.org/
- King County Historic Preservation Program http://www.kingcounty.gov/property/historic-preservation.aspx
- 4Culture http://www.4culture.org/.

Present-Day Land Use Patterns

The subarea today consists primarily of single family neighborhoods zoned as R-6 (residential, six units per acre) and developed at an average density of 2.7 units per acre. In addition to single family residential uses, there are several churches, parks, schools, and school properties within and in proximity to the subarea. For example, the Shoreline Center, owned and operated by the Shoreline School District, is a large complex that serves many community functions (see Key Opportunity Sites in the Subarea for more information).

Most of the neighborhoods in the subarea were developed as single-family housing in the decades following World War II, primarily from the mid- to late 1940s through the 1970s, when the area was part of unincorporated King County. When the neighborhoods were originally developed, street standards did not require sidewalks, and as such, most of the local streets today do not have sidewalks or bike lanes. Surface water management standards also were less intensive than they are today and as such, there are frequently drainage issues in the subarea. Stormwater facilities are generally below the standard now required by the Department of Ecology, and there are very few low impact development facilities such as rain gardens.

The City of Shoreline, incorporated in 1995, now has jurisdiction over this area and works with the community to prioritize capital transportation and infrastructure improvements throughout the city. Although some improvements have been made in the subarea in recent years, budget constraints have limited the level of street and utility improvements completed to date. In the coming years, the City intends to leverage the regional investment made to implement light rail and prioritize improvements in the station subarea to serve proposed growth.

Growth and change over the past 50 years in the subarea has been minimal, limited to areas that are zoned to accommodate redevelopment into a mix of residential, commercial, retail, and office uses, such as in the North City area and along the Aurora Avenue N corridor. Refer to Section 3.2 for a discussion of population, housing, and employment, including existing conditions, trends, and growth forecasts and targets. While the focus of planning is the subarea surrounding the proposed light rail station, boundaries also encompass existing commercial/retail and multifamily land use areas in a portion of the North City business district (north of NE 175th Street) and along Aurora Avenue N, as part of the Town Center district.

Current Neighborhoods in the Subarea

The subarea includes the following defined Shoreline neighborhoods:

- Meridian Park
- Echo Lake
- North City

Other neighborhoods on the periphery of the subarea include Ridgecrest, Ballinger, and Parkwood. **Figure 3.1-3** illustrates the neighborhood area boundaries in proximity to the subarea.

Shoreline's neighborhoods are very engaged in the community and maintain active neighborhood associations . Shoreline's Council of Neighborhoods consists of two representatives from each of the neighborhood associations (including those listed above). The Council of Neighborhoods meets monthly to network, learn about other neighborhood events, and meet with City representatives. This two-way communication allows neighborhood associations to provide community input and the City to present information on programs and projects. Brief descriptions, including historical information, for the four primary neighborhoods in proximity to the subarea follow.

Meridian Park Neighborhood—Located in the center of Shoreline, the Meridian Park Neighborhood extends north to south from N 185th Street to N 160th Street and west to east from Aurora Avenue N to Interstate 5. The neighborhood has several parks, including Cromwell Park (bordering the subarea) and Ronald Bog natural area and park (located outside the subarea), home to the signature artwork the "Ponies." The neighborhood is proud of opportunities residents have to get close to nature, with a diversity of wildlife at Ronald Bog Park and other areas, including ducks, birds, turtles, frogs, and an occasional beaver, to name a few.

Similar to the history of other Shoreline neighborhoods, many of the homes were developed during the post World War II era and the Baby Boom decades. Families were attracted to the opportunities to purchase new homes developed at economical prices located in various plats. The area became known as a great place to live, and high quality schools were established along with parks to serve the new residents. Today, the predominant land use in Meridian Park still consists of single family homes, with the exception of commercial uses along Aurora Avenue N.

Echo Lake Neighborhood—The Echo Lake Neighborhood extends from the Shoreline city limits and King County line (at 205th Street) to the north, to 185th Street to the south, and extends east and west between Aurora Avenue N (State Route/Highway 99) and I- 5.

Echo Lake has an interesting history that intertwines with the history of Shoreline. Settlers started moving to the area by 1862 and in 1900, a shingle mill was built at the north end of Echo Lake. The mill burned down in 1912 and was never rebuilt.

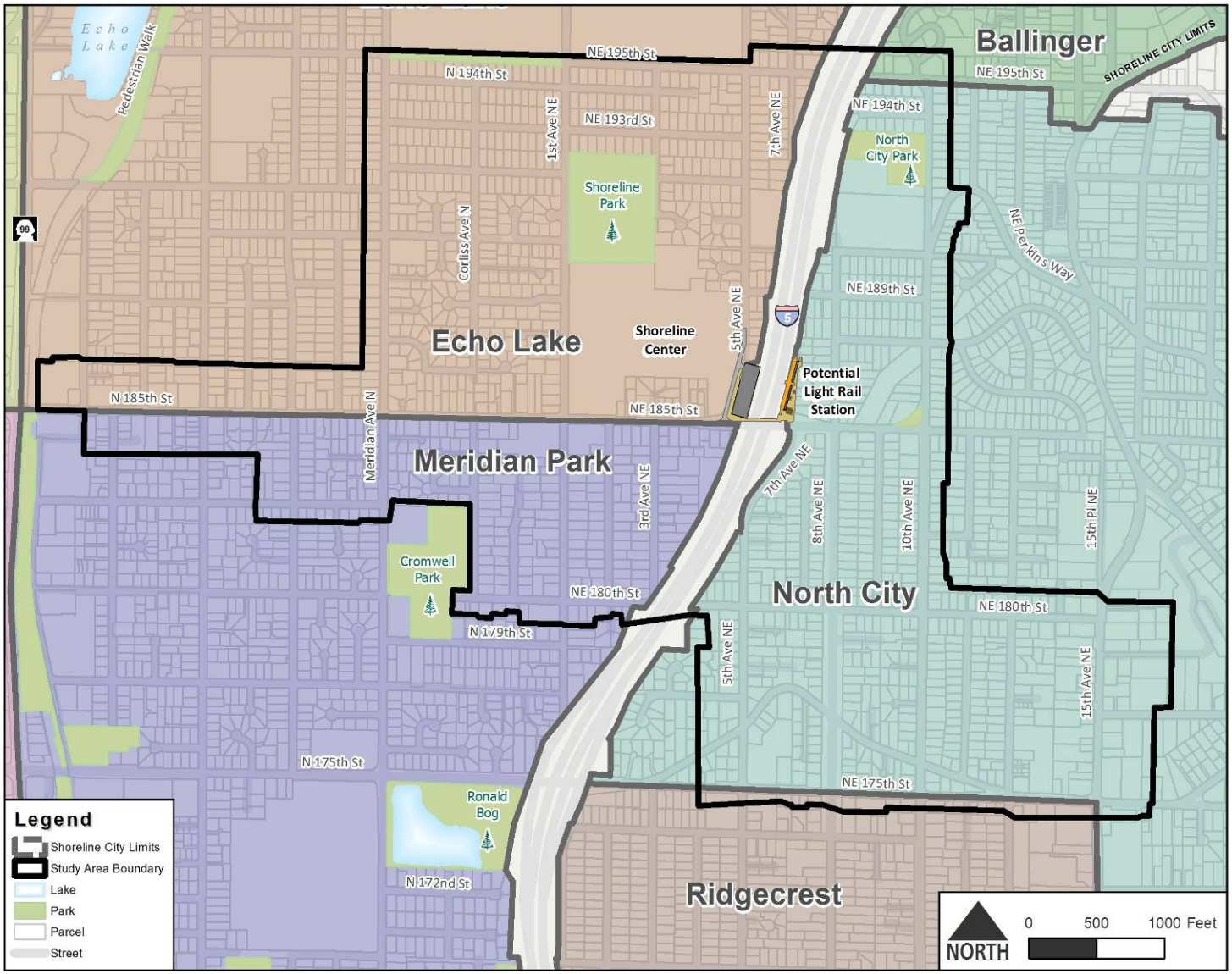


Figure 3.1-3 Existing Neighborhoods in the Vicinity of the 185th Street Station Subarea

Meanwhile, workers were busy building the Interurban streetcar rail line, headquartered at a camp located near the mill. The trolley line extended between Seattle and Everett and brought more people to Echo Lake and the surrounding area for recreation. Today, the Interurban Trail, a signature public recreation corridor in Shoreline, follows the old streetcar's alignment.

As more people began owning automobiles, Echo Lake became a popular attraction for day trips. The North Trunk Road was constructed in 1913 to serve the area and paved in brick. A portion of this road, today known as Ronald Place (named after Judge Ronald, an advocate for construction of the road), has been preserved as an important historic feature of Shoreline.

Interest in the area prompted development in the 1910s and 1920s and "Echo Lake Park" became one of the first plats, advertised as "an ideal setting for getting away and owning your own little piece of rural America." After residences became established, businesses followed, and eventually the new, straight Highway 99 was built replacing portions of the old winding brick road.

While more and more businesses sprang up along the Highway 99 thoroughfare, changing the character of the corridor, Echo Lake continued to be known as a fun place to go into the 1930s, 1940s, 1950s, and beyond. The Echo Lake Bathing Beach and Holiday Resort were popular weekend escapes for visitors from the city, looking for a rural retreat.

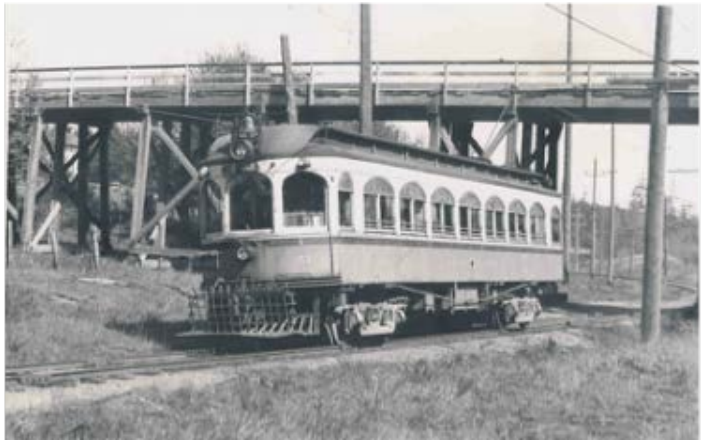
Echo Lake's history as a popular recreational destination continues to this day with the recent development of the Dale Turner Family YMCA near the south end of the lake. The Echo Lake Apartments are another recent mixed use redevelopment project with multifamily residences and businesses at the corner of Aurora Avenue N and N 192nd Street. While land uses along Aurora Avenue N are predominantly commercial, elsewhere throughout the Echo Lake Neighborhood there are a variety of single family and multifamily housing options, along with schools, parks, and other community destinations, including the Shoreline Center.

North City Neighborhood—The North City Neighborhood is located east of Interstate 5 and extends to NE 195th Street to the north, NE 160th Street to the south, and the City of Lake Forest Park to the east. 15th Avenue NE is the central spine of the neighborhood and the North City business district (discussed in more detail later in this section) has become a commercial hub for Shoreline neighborhoods east of Interstate 5. The eastern edges of the neighborhood rise in elevation and the roads wind through forested, hilly topography to provide access to homes. An interesting story of this area, based on knowledge of long-time residents, relates to the dirt motorcycle paths that people rode on for recreation in the mid-1900s. This area came to be called "motorcycle hill." Later in 1954, the Firview Terrace subdivision was developed, and recreational motorcycling in the forested hillside area was no longer an option.

With commercial, mixed use, office, and multifamily residential uses concentrated primarily in the North City business district centered around NE 175th Street, the remainder of the neighborhood consists primarily of single family homes. With approximately 2,859 homes, North City is one of the largest neighborhoods in Shoreline .

Historic Photos of Shoreline

The historic image above, circa 1910, shows the old Interurban Streetcar line looking northwest. The image below, circa 1916, shows a group visiting from Ballard in Seattle for a day of berry picking near the lake. (Photos courtesy of the Echo Lake Neighborhood Association and Shoreline Historical Society, with some photos donated by Florence Butske)



The historic image above from 1930 shows a woman standing along the new Highway 99, with the new Echo Lake Bathing Beach sign, and the image below shows the Interurban Trolley crossing under the trestle at N 200th Street. (Photos courtesy of the Echo Lake Neighborhood Association and Shoreline Historical Society, and photos donated by Florence Butske)

NOTE: While these historical scenes are from locations outside the station subarea, they provide context of the history of development of the Shoreline area

Existing Conditions in the 185th Street Station Subarea

Cromwell Park


Looking East on 180th Street toward North City


Shoreline Center at the southeast corner


Aurora Avenue North green street improvements


North City Park


Shoreline Pool operated by the City of Shoreline


Looking North on 8th Avenue NE from NE 180th Street


Powerline corridor looking north from NE 185th Street


North City, 15th Avenue NE

With recent and ongoing redevelopment of the business district, the neighborhood now offers a variety of housing choices (for sale homes and condominiums as well as homes and apartments for rent) for a diversity of budgets. The neighborhood also features nearby parks with playgrounds and active recreation facilities, as well as natural open spaces, wooded areas with trails, and other amenities that are easily accessible by foot.

Ridgecrest Neighborhood—The Ridgecrest Neighborhood extends from I-5 east to 15th Ave NE and from the southern boundary of NE 145th Street to the northern boundary of NE 175th Street. As such, this neighborhood borders the subarea. While no zoning changes are proposed under the 185th Street Station Subarea Plan to the Ridgecrest neighborhood, the subarea planning process for the 145th Street Station is currently underway and potential zoning alternatives in the neighborhood are being evaluated in a separate environmental analysis.

The first major housing development in the neighborhood happened in the mid 1940s, near the end of World War II. Returning soldiers could purchase any one of the 100 houses that were built in 100 days. So many families with school age children moved to the neighborhood that the newly completed Ridgecrest Elementary School had to run double shifts. The majority of the single family housing stock was built in the late 1940s to early 1950s on large lots, set well back from the streets. Although some homes in this neighborhood were built earlier, including a log cabin built in 1933 from trees logged from the property that still stands today (but is located outside the station subarea).

Today, Ridgecrest is a primarily a middle income, working class neighborhood that is both multi-cultural and multi-generational. According to the 2010 US Census, Ridgecrest had 6,116 residents and 2,175 homes, making it one of the most populated neighborhoods in Shoreline. The neighborhood also has nine churches and four parks, as well as Shoreline's only theatre and skate park and the oldest operating 7-11 store in the State of Washington.

Special Districts, Key Sites, and Redevelopment Opportunities

Town Center District

Located in the middle mile of the city's three-mile-long Aurora corridor (Highway/SR 99), Town Center is the geographic center of the community of Shoreline. Located at the crossroads of three of the city's most heavily traveled roads, N 175th Street, N 185th Street and Aurora Avenue N, Town Center is the civic and symbolic center of the community. Early in the life of the new City of Shoreline, a citizens survey identified this area as the "Heart of Shoreline."

The Town Center Subarea Plan, adopted in 2011, makes note of the growth management strategy in the Vision 2040 plan for the central Puget Sound region, which forecasts an additional 1.7 million people and 1.4 million jobs in the region by 2040 with only a negligible increase in the size of the region's urban growth area. This strategy, combined with state climate change targets to reduce greenhouse gas emissions and vehicle miles traveled, means there will be increasing pressure on close-in cities such as Shoreline to accommodate future growth.

Shoreline's ability to accommodate these pressures while maintaining the community's reputation as one of America's best places to live will be a critical in the coming decades. Implementation of the Town Center Subarea Plan will be one important strategy to help Shoreline meet that challenge.

Portions of the Town Center Vision Statement restated below articulate the intended future for this central core of the City:

"Shoreline Town Center in 2029 is the vibrant cultural and civic heart of the city with a rich mix of housing and shopping options, thriving businesses, and public spaces for gatherings and events. People of diverse cultures, ages, and incomes enjoy living, working, and interacting in this safe, healthy, and walkable urban place

…Notable features include a number of green open spaces with both large and intimate enclosed plazas, storefronts opening onto parks and wide sidewalks, underground and rear parking, numerous ground-floor and corner retail options within mixed use buildings, and internal streets within large blocks with other pathways that provide safe, walkable and bikable connections throughout the Center…

Building heights range from one to three stories within transition areas adjacent to single family residential areas along Linden and Stone Avenues and up to six stores in mixed use buildings along sections of Aurora Avenue N, while buildings in the Midvale and Firlands areas are generally four to five story mixed use structures. Building materials, facades, designs, landscape spaces, as well as public art and green infrastructure features represent a wide variety of styles and functions while maintaining a harmonious look and feel.

The City of Shoreline has long been committed to the realization of the three E's of sustainability—environmental quality, economic vitality, and social equity—and Town Center has successfully integrated these values to achieve sustainable development."

Consistent with this vision and the goals and polices of the Town Center Subarea Plan (summarized in Chapter 2 of this FEIS), there are redevelopment and revitalization opportunities throughout Town Center, some of which have already been realized and some still to be implemented in the coming years.

The 185th Street Station Subarea overlaps with the Town Center Subarea at the west end of N 185th Street, near the intersection with Aurora Avenue N. There are opportunities to enhance the sense of gateway toward the west to Town Center, within the 185th Street Station Subarea, as well as to enhance the sense of gateway toward the east, as the key corridor connecting to the 185th Street light rail station.

North City District

The North City Subarea is a business district that includes primarily commercial uses as well as some mixed use, multifamily residential, and office/employment uses. Located at the east end of the 185th Street Station Subarea, North City is a linear district focused around the central spine of 15th Avenue NE, extending from 24th Avenue NE to a few blocks south of NE 170th Street.

Vision illustrations of North City from the North City Subarea Plan

The City of Shoreline adopted a subarea plan for North City in 2001. The subarea has been undergoing redevelopment and revitalization as a result of plan adoption, and additional opportunities for redevelopment still exist in the subarea today.

The North City Subarea Plan called for recognizing the heart of North City as being located along 15th Avenue NE, between NE 175th and 177th Streets with the corner of NE 175th Street as the gateway to the area. The plan therefore requires first floor retail here. Retail is allowed, along with residential on the rest of the street. In order to maximize the spatial quality of a neighborhood main street, the buildings along 15th Avenue NE area required to step back from the street as they get higher. In order to establish a walkable shopping environment, 15th Avenue NE is reduced to three lanes, the middle lane functioning as the left-turn lane. This configuration will slow traffic without impeding flow.

With recent development and parking concerns, there have been lessons learned about potential conflicts that can arise between large multifamily development and adjacent single family homes. This has helped to inform the station subarea planning process.

Shoreline Center

The Shoreline Center was once the location of Shoreline High School and is now the home of central offices of the School District, offices for several local non-profit agencies, and conference center facilities. The Shoreline Center is owned and operated by the Shoreline School District, which allocates proceeds from the Center's operations to the general fund of the 10,000 student district.

The forty-acre campus, located just west of the I-5 corridor and north of N 185th Street, also includes the Shoreline Stadium (a venue for local and regional school sports events), the Spartan Recreation Center (a multi-use community facility jointly owned and operated by the Shoreline School District and the City of Shoreline), and the Shoreline / Lake Forest Park Senior Center (a

community support center and gathering place for senior citizens). On adjacent property to the north of the campus, the City of Shoreline operates the Shoreline Pool and Shoreline Park.

The Shoreline Conference Center hosts a wide variety of events from small meetings and workshops to large conferences and conventions, and social gatherings such as community banquets and wedding receptions. One of the ten largest event venues in the Seattle area, the Conference Center's hallways serve as a gallery for art work created by students of the Shoreline School District, enjoyed by hundreds of thousands of visitors each year. Works by local professional artisans are also displayed in the on-site gallery of the Shoreline Lake Forest Park Arts Council.

Luncheon event at the Shoreline Conference Center

Recognizing the potential opportunities that could be afforded with redevelopment of the large site, the School District intends to hire a consultant to examine the best use for their property with regard to their mission. Redevelopment concepts in the 185th Street Station Subarea Plan can help to inform potential options for the Shoreline Center site, and the City welcomes input from the District about their long-term vision for properties within the subarea. However, it should be noted that any decisions about redevelopment of the site are entirely up to the School District.

North City Elementary School Site

The North City school site, located at 816 NE 190th Street in the subarea, is the former site of the North City Elementary School. Presently, the North City Cooperative Preschool and Home Education Exchange (providing resources to home schooled students and parent teachers) are operated at this location.

The four-acre North City Park site is located to the north of the school site. The elementary school, which had an enrollment of approximately 375 students, was closed at the end of the 2006-2007 school year after Shoreline School District determined elementary students could be accommodated at other schools. This resulted from a decline in student enrollment that occurred over the previous decade.

Given that this site is actively used and there would be a need for additional school facilities and services in the future as the neighborhood grows, the Shoreline School District intends to retain this property. The 185th Street Station Subarea Plan recognizes its use as an important existing and future educational site. Any decisions about future use of this site would be entirely up the School District.

Seattle City Light Transmission Line Rights-of-Way

Seattle City Light (SCL) transmission lines occupy a right-of-way that extends through the subarea from north to south from the corner of 10th Avenue NE and NE 188th Street, diagonal through the block and then extending down the east side of the 8th Avenue NE right-of-way. While access must be maintained to the transmission towers for maintenance, Seattle City Light may allow public use under the transmission lines. These areas could potentially be used for public open space, community gardens, and connecting trails/paths through the subarea, contingent upon approval by SCL.

Church Properties

There are a number of church properties within the station subarea that hold potential for redevelopment due to their size and location along arterial and collector streets. If the property owners are willing and interested, portions or all of these sites have the potential to be redeveloped over time, converting all or portions of the site to housing (including affordable options). Proposed zoning for the Preferred Alternative, Alternative 4 would support this redevelopment (as would the zoning under Alternative 3—Previous Most Growth and Alternative 2—Some Growth). These properties could either be redeveloped directly by the owners or sold to interested developers in the future at the owners' discretion.

Home-based Businesses and Interest in Converting from Single Family Use

There are a few small neighborhood businesses in the subarea, and an interest in more flexibility to convert single family homes to office and small business use. As with other urbanizing areas, there will be a growing need for more neighborhood services and businesses in the subarea, under any of the action alternatives studied in the FEIS. There is also an increasing trend in teleworking, with more people interested in having home-based businesses and offices. This growing need can be addressed through adjustments to zoning regulations to provide more flexibility to operate a wider variety of business and office uses from homes, and to convert single family homes to business and office uses. Refer to discussion later in this section about proposed zoning and development provisions that would accomplish this under the action alternatives.

Redevelopment Potential Based on Market Analysis and Recent Trends

Redevelopment opportunities in the subarea are based on a specific station subarea market assessment prepared for the City of Shoreline by BAE Urban Economics (November 2013). Information from Sound Transit's Lynnwood Link Extension Station Area Transit-Oriented Development Potential report (April 2013) also was reviewed. Redevelopment opportunities consider the long-range potential for growth and change in the station subarea consistent with Shoreline's vision and the regional objective to maximize the number of people living and working in proximity to high-capacity transit.

Key findings of the station subarea market assessment completed by BAE Urban Economics include the following.

- Key target markets over time would include younger millennial and older empty nester households seeking

both for sale and for rent options, as well as a more mixed use urban environment.

- There is the potential to create transit-oriented development at the new NE 185th Street Station and connect it via an enhanced transit boulevard to the emerging transit-oriented development of the Aurora Avenue N/Town Center corridor and the mixed use node in North City along 15th Avenue NE. The proximity of the core commercial area in North City to the proposed light rail station presents an opportunity to enhance access for pedestrians, bicycles, and local transit along NE 185th Street, 10th Avenue NE, and NE 180th Street, as well as other streets in the subarea. This is also the case in making connections to the Aurora Avenue N corridor, located approximately one mile from the proposed station. These improvements would enhance residents' access to and from the new station, as well as to and from retail and neighborhood services.

- The primary market opportunity for new development at the NE 185th Street Station Subarea is the development of residential units over the next twenty years. Approximately 700 units would represent 15 percent of the new residential growth that PSRC projects for all of Shoreline through 2035, but there may be additional demand beyond this, and certainly there would be additional longer-term demand in the subarea. The redevelopment of the Shoreline Center site, west of I-5 would serve an important role in the station subarea's overall growth over the long-term.

While the market assessment prepared by BAE Urban Economics for the 185th Street Station Subarea identified a potential demand for up to 700 residential units through 2035, additional demand for housing could occur during the next twenty years depending on changes in the market, opportunities provided elsewhere, property owners' willingness to redevelop or sell their properties for redevelopment, what happens at the Shoreline Center site, and other factors. Certainly, the demand for housing would continue beyond twenty years, and may grow higher depending on these factors.

- Due to the complexities of assembling properties to create large enough sites for redevelopment into housing and mixed use redevelopment, the process would be incremental and gradual. For this reason, some of the larger sites, such as church properties, the Shoreline Center site, etc. could be better suited to moving ahead in the redevelopment process if their owners are interested and willing to redevelop or sell to developers.

- A variety of residential types could be supported around the station subarea, including a mix of for-sale condominiums, for rent apartments, townhouse and row house units, various other types of multifamily and attached single family buildings, and small single family clustered housing/cottage units. Another potential product type based on Shoreline's aging population would be age-restricted (55+) housing.

- In the initial years of neighborhood redevelopment, after the light rail station is operating, it is anticipated that the demand for retail would be limited to a small amount of convenience oriented retail serving residents and transit riders and located at the transit station (once the station is operating). The station area currently lacks retail uses, with the nearest neighborhood retail located just over one-half mile away on 15th Avenue NE, and the city's primary commercial corridor on Aurora Avenue N one mile away. The station area is too far away from either of these areas and lacks I-5 access to draw some types of retail. However convenience-oriented, neighborhood retail uses (e.g. coffee shops, cafes, sundries, personal services, etc.) located at the station, or within a direct sight line between the station and any parking structure, would maximize access to transit riders and immediate area residents and have the greatest potential.

- Over the longer term, more demand for neighborhood-serving retail and services would be driven by increased population and households in the subarea. It may be beneficial to adopt zoning that would allow conversions of single family homes along major corridors for these types of uses (e.g. homes converted to dental office, tax accountants, coffee shops, etc.) to serve the transitioning demand over time.

- There appears to be little potential for office or other types of institutional uses. Shoreline does not currently have a substantial office market and is positioned between much larger office markets in Lynnwood and North Seattle. Most existing office space is geared toward local-serving professional and service firms.
- The existing development pattern of the station area and its location will cause redevelopment to happen very gradually, over many decades, due to the difficulty of assembling sites for development in the single-family neighborhoods given current parcel sizes. Development interest is likely to be more focused on the Aurora Avenue N and North City corridors because they are established locations that already offer a mix of housing types and retail choices.

The Urban Land Institute (ULI), a national professional organization for developers, real estate investors and land use professionals researches and tracks trends in redevelopment across the nation. In a 2014 forecast of "development prospects," ULI ranked infill housing and urban mixed use redevelopment as the two highest prospects. Retiring baby boom generation and the emerging generation of home buyers and renters (also known as the Millennials or Generation Y) are creating a higher demand for urban infill housing and mixed use.

Based on recent studies by ULI and others, both of these types of consumers are seeking active neighborhoods and in many cases are looking for more compact, connected urban lifestyles. While urban central cities are projected to do well in the coming years based on this demand, places that mix the best of suburban and compact, mixed use qualities may be most desirable. In a recent national survey "America in 2013: Key Findings on Housing, Community, Transportation, and the Generations" ULI found that among all adults polled (including Baby Boomers and Millennials/Gen Y-ers), the quality of public schools, parks and

recreation opportunities, walkability, and short distance to work or school all ranked as important or very important.

Shoreline's reputation as a livable community, with good schools, parks, trails, and other amenities, will continue to attract residents in the coming decades. However, the potential timing and pace of redevelopment is difficult to predict given the influences of market forces, property owner interests, the need to assemble large enough parcels for redevelopment, and many other factors described earlier.

For more information on market analysis and trends refer to the report prepared by BAE Urban Economics, available at: http://www.cityofshoreline.com/Home/ShowDocument?id=15704 as well as the analysis prepared by Leland Consulting Group for the 145th Street Station Subarea, available at: http://www.cityofshoreline.com/home/showdocument?id=17855.

A final point to note regarding market analysis: The Lynnwood Link Extension Station Area Transit-Oriented Development Potential report completed by Sound Transit in 2013 included a preliminary market assessment of the demand for office space, multifamily housing, retail space, and lodging. The findings of the TOD Development Potential report were generally consistent with the findings of the subarea market assessment described above.

Relationship of the City of Shoreline Comprehensive Plan and Code Provisions to the Subarea Plan

The 185th Street Station Subarea Plan would become an adopted element of the City of Shoreline Comprehensive Plan. Additionally, the City of Shoreline Comprehensive Plan contains extensive goals and policies that are relevant to the subarea and planned action, including specific framework policies for the light rail station areas and Land Use Element policies that guide station subarea planning. Relevant goals and policies of the Comprehensive Plan, as well as the plan's land use designations, and other applicable provisions area summarized in Chapter 2 of this FEIS. Comprehensive Plan amendments would be required to support adoption of the subarea plan, as described later in this section under 3.1.2 Analysis of Potential Impacts.

The City of Shoreline's Development Code, a section of the Shoreline Municipal Code includes requirements, standards, and guidelines for zoning and development, including private and public facilities. Specific revisions and updates to the Development Code would be required with adoption of the subarea plan. Since light rail is a new form of transit service coming to the community with unique opportunities, the Development Code revisions would include new and unique regulations to implement the City's vision for the subarea. Development Code amendments to support the 185th Street Station Subarea Plan would create new zoning designations and provisions to address building setbacks, architectural step-backs of buildings, building heights, design standards, allowable uses, housing types, transition standards between land uses, parking

requirements, and affordable housing provisions. These are described in more detail in Section 3.1.3 Mitigation Measures.

3.1.2 Analysis of Potential Impacts

This section of the FEIS analyzed potential impacts related to land use of the four alternatives: Alternative 4—Preferred Alternative, Alternative 3—Previous Most Growth, Alternative 2—Some Growth, and Alternative 1—No Action. Proposed zoning under the three action alternatives is shown in **Figures 3.1-4**, **3.1-6**, and **3.1-7** later in this section. Alternative 1—No Action retains existing zoning and is shown in **Figure 3.1-8.**

Given Shoreline City Council's designation of Alternative 4 as the Preferred Alternative, analysis in this section of the FEIS focuses on the potential impacts of adoption and implementation of Alternative 4 (or potential phasing thereof), while also briefly summarizing the potential impacts of other alternatives for comparative purposes. Refer to the DEIS for additional discussion and information regarding Alternatives 3, 2, or 1.

For more information about how Alternative 4 was developed and selected for environmental analysis, refer to Chapter 2 of this FEIS. For more information about forecasted growth and growth targets for population, households, and employment, refer to Chapter 2 and Section 3.2 of this FEIS.

Necessary Plan and Code Amendments

Adoption of any of the action alternatives, including Alternative 4—Preferred Alternative, would require updates to the Shoreline Comprehensive Plan and Shoreline Municipal Code (including the Development Code and zoning provisions). This is an expected outcome of the subarea planning process, and the City is prepared to make these amendments.

Comprehensive Plan amendments effective upon adoption of the subarea plan would revise the Land Use Map to correspond with zoning designations. Goals and policies of the Land Use Element, including those pertaining specifically to Mixed Use and Commercial Land Use and Light Rail Station Subareas would be revised to more closely align with the subarea plan and its proposed policies as part of the 2015 docket cycle. Because Comprehensive Plan policies listed in Chapter 2 are applicable to the subarea, the subarea plan includes a nominal number of proposed policies, which would provide direction regarding implementation or further study.

Shoreline Development Code provisions would need to be amended specifically related to zoning designations and other regulations. Proposed zoning is described later in this section. All three action alternatives would require amendments to the zoning and Development Code provisions. City zoning maps would need to be amended, and zoning descriptions and requirements related to the new zoning categories would need to be integrated into the City's Code.

The City intends to amend its existing zoning provisions and development standards to better support the adopted subarea plan. This would include providing more flexibility for home-based businesses (with a longer list of types of business and office use allowed) as well as for converting single family homes to exclusive business or office use.

The City is considering potential amendments to the Development Code to allow for development agreements within

the MUR-85'zone. With a development agreement, bonus density/height could be granted by the City with the provision of specific amenities in the project (such as parks and open space preservation, low impact development, affordable housing, and other provisions). Other development standard amendments address requirements such as height, setbacks, step backs in buildings, architectural treatments, and a variety of other provisions applicable to the MUR-85', MUR-45', and MUR-35' zoning.

Recommended Development Code amendments are described under 3.1.3 Mitigation Measures, and will constitute Exhibit C of the Planned Action Ordinance, which is the mechanism by which they will be adopted, potentially at the February 23 Council meeting.

Alternative 1—No Action would not amend existing zoning or development standards.

Proposed Zoning Categories and Descriptions

Three new zoning categories are being introduced for the subarea. These would be applicable under any new zoning adopted for the subarea.

- MUR-85': Mixed use residential with 85-foot building height
- MUR-45': Mixed use residential with 45-foot maximum building height; based on R-48 zoning
- MUR-35': Mixed use residential with 35-foot maximum building height; based on R-18 zoning

These new zoning designations were developed to support neighborhood-serving businesses and additional housing styles. They represent a change from the current system of defining zoning by density maximums to using height limits instead. The City is updating Code provisions to add these zones and define allowed uses; dimensional, design, and transition standards; mandatory requirements; and incentives for desired amenities. Existing single-family homes are protected under all new zoning designations. Refer to the figures at the end of this section for illustrations of potential housing styles that could be built within these zoning categories.

MUR-85'

Mixed-Use Residential—85-foot height: This zone would allow building heights of 85 feet (generally 7 stories tall). Building types would typically be mixed use with residential and/or office uses above commercial or other active use at the ground floor level. This designation could be applied to areas within roughly a ¼ mile of the station, and allow the highest intensity uses. Generally, 7 stories is as tall a building as can be built using concrete and wood; above that steel must be used, which substantially raises construction costs. Extra height was included to allow for mechanical equipment, or potentially amenities like a gazebo on a green roof.

The Planning Commission discussed, and included in draft regulations, provisions for a developer agreement that could award additional height/density for projects that provide a mix of required and optional amenities. See additional discussion later in the section and draft development regulations for more information.

It is anticipated that is could take many years to implement redevelopment at the density allowed in the MUR-85' zoning. Redevelopment of this type (supporting building heights of seven stories or more with development agreements) would require aggregation of a large number of parcels. It is not currently known how many single family property owners are interested in aggregating their lots for redevelopment. Also, given current market forces, it may be some time before this building type is developed in the subarea.

MUR-45'

Mixed-Use Residential—45-foot height limit: Similar to the existing zoning category R-48 that allows 48 dwelling units per acre, this zone would allow multi-family building types. The height limit for MUR-45' would be 45 feet (differing from the height limit of R-48, which currently varies from 40 feet if adjacent to single family zones, 50 feet if adjacent to multi-family zones, and 60 feet with a Conditional Use Permit). The new MUR-45' zone would be limited to 45 feet regardless of adjacent zoning, which equates to a 4-story building. The MUR-45' zone would allow housing styles such as mixed use buildings with three levels of housing over an active ground floor/commercial level. Buildings such as row houses, townhomes, live/work lofts, professional offices, apartments, etc. also could be developed in MUR-45', and single family homes could be converted to commercial and professional office uses like in MUR-35'.

MUR-35'

Mixed-Use Residential—35-foot height limit: Similar to the existing zoning category R-18 that allows 18 dwelling units per acre, this zone would allow multi-family and single family attached housing styles such as row houses and townhomes. The height limit for this zone is 35 feet, which is the same as single-family R-6 zones, and equates to a 3-story building. MUR-35' also would allow commercial and other active uses along streets identified as arterials. These types of buildings might include live/work lofts, professional offices, and three-story mixed use buildings (two levels of housing over one level of commercial). This also would allow conversion of existing homes to restaurants, yoga studios, optometrist offices, and other uses.

Change of MUP Zone in DEIS to MUR-85' in FEIS and Developer Agreements

The Master Use Permit (MUP) category introduced in the DEIS has now been replaced with the MUR-85' category, with the understanding that Development Agreements can be implemented anywhere within the MUR-85' zoned areas.

MUP was to be a new zoning designation that only applied to the previous Alternative 3 in the DEIS. This designation was proposed to allow flexibility for development standards on large sites and would apply bonus height and density based on the variety and amount of community amenities and spaces offered by the developer. The new MUR-85' category now provides this flexibility.

The built form assumed for the MUP zoning designation would allow up to a 140-foot maximum height limit and was designated for use on the Shoreline Center site only. With development of Alternative 4—Preferred Alternative, it was determined that the bonus for density and height could apply to any property zoned MUR-85', not just the School District sites, but anywhere with the

zoning designation of MUR-85' if the project provides certain amenities. Required provisions would include affordable housing, park space, green building, and structured parking. Optional amenities could include a number of other community amenities. In this negotiated agreement, additional height/density could be awarded, allowing heights to exceed 85 feet, but not more than 140 feet. For purposes of the analysis in this FEIS, it was assumed that 25 percent of the properties zoned MUR-85' would be developed to the 140-foot height at build-out, although this assumption is likely high given current market forces and property configurations in the subarea.

Potential Phase 1 Zoning Area of the Preferred Alternative

If Council were to adopt Alternative 4—Preferred Alternative entirely or in phases, it would serve as a long term master plan for the subarea, and provide the most capacity to achieve the desired vision for the station subarea. Comprehensive Plan Land Use policy LU31 provides direction to examine phasing redevelopment. In a joint meeting of the Shoreline Planning Commission and City Council on September 29, 2014, they discussed the benefits of having a more predictable pattern for growth to guide planning and implementation over the next few decades, and weighed them against potential disadvantages to phased zoning.

The City Council decided to study the potential of phasing zoning over time, and on October 2, 2014, the Planning Commission defined boundaries of a potential "Phase 1" zoning area. This approach would require that redevelopment under the new proposed zoning categories within the next twenty years would be located within the proposed Phase 1 boundary.

The Phase 1 zoning area identified by the City is shown in **Figure 3.1-5** later in this section. This proposed Phase 1 zoning area would be in place for nearly twenty years (according to the draft code language being proposed- ten years after light rail is operational in 2023). The City Council could then revisit the proposed zoning of the subarea plan and "unlock" the remaining area of zoning at that time.

The proposed Phase 1 zoning boundary focuses the potential area of change more closely around the future light rail station and along the N-NE 185th Street/10th Avenue NE/NE 180th Street corridor than the full extent of zoning proposed under Alternative 4.

Over the next twenty years and beyond, it will be important that the station subarea redevelop as a cohesive, connected community that is supportive of transit, but also that provides residents and potential developers with some predictability about when market forces are likely to support redevelopment of different areas. The Phase 1 zoning area would help to provide this. Rezoning in a phased manner also would allow the opportunity to monitor the development market and redevelopment results and determine where regulations and incentives are creating the kind the community envisioned through the subarea planning process, prior to allowing redevelopment of a larger area.

The proposed Phase 1 zoning area attempts to balance to the provision of an adequate level of housing choice and enabling flexibility in future redevelopment with concerns about rezoning too broadly in the subarea in initial years, which could result in unintended effects such as spotty development patterns, delayed maintenance, and over-valuing of property. Implementing the Phase 1 zoning area would help to focus initial development closer to the station and define an area for concentrating improvements within the next twenty years to support initial growth. This could also potentially be accomplished by targeting incentives to smaller geographic areas along the 185th Street corridor.

Decision-makers are interested in hearing from residents regarding their preference on whether or not to phase adoption of zoning.

Retention of Existing Zoning Designations

The action alternatives would retain varying portions of the subarea in existing zoning designations. Existing zoning categories in the subarea were listed in Chapter 2. For more information about these zoning designations, refer to the DEIS and the Shoreline Municipal Code:
http://www.codepublishing.com/wa/shoreline/

Consistency with Plans and Policies

The Washington State GMA requires participating jurisdictions to conduct capital facilities planning for six and twenty year planning horizons. This FEIS and the 185th Street Station Subarea Plan summarize capital facilities improvements that would be needed to support implementation of rezoning (redevelopment) in the station subarea over the next twenty years. The subarea plan and planned action will set a growth target that provides a framework for anticipated population, household, and employment growth between 1.5 percent and 2.5 percent annually. By identifying an area for initial focus, capital improvements can be better defined to serve that area.

If growth were to exceed the overall average of 1.5 percent to 2.5 percent and occur more quickly, achieving the twenty year growth target more quickly, the City would update capital facilities improvements planning to support additional growth beyond the twenty year target. The City updates its capital facilities plans on a regular basis anyway, and will continue to closely monitor improvement needs in the subarea as growth and change occur over the next twenty years to ensure that sufficient infrastructure (transportation, utilities, etc.) is in place to support redevelopment as it occurs.

Alternative 4—Preferred Alternative best supports the City's and region's adopted plans and policies for more intensive and vibrant urban development around high-capacity transit stations. Redevelopment implemented under Alternative 4 would support many of the City's adopted policies under various elements of the Comprehensive Plan, as well as adopted policies and provisions of the Town Center and North City Subarea Plans. The Preferred Alternative also would support a variety of local, regional, state and federal policies related to smart growth, livability, and climate action. Refer to Chapter 2 for a list of policies at the local, regional, state, and federal levels that are relevant to and supported by the subarea plan.

Alternative 3—Previous Most Growth and Alternative 2—Some Growth also are consistent with adopted plans and

policies, but to a lesser extent than Alternative 4. Alternative 4 would result in the highest level of housing choices including affordable housing and the most opportunities for creating an equitable transit-oriented community, consistent with adopted plans and policies. While Alternative 3—Previous Most Growth proposes more employment than Alternative 4, it would result in fewer housing opportunities.

Alternative 1—No Action is not consistent with or supportive of the City's adopted Comprehensive Plan or policies of other plans adopted by the City. Alternative 1 also it is not consistent with plans and policies adopted at the regional, state, and federal levels, it is not a viable option for meeting the purpose and need of the planned action.

Land Use Patterns and Compatibility between Land Uses

Under all alternatives, it is anticipated that the subarea would experience growth and change. Alternative 4—Preferred Alternative would result in the most change at full build-out of all the alternatives. That said, it is anticipated that the pace of change during the first twenty years after adoption would generally be the same with any of the action alternatives. It is estimated that the pace of growth and change would average around 1.5 percent to 2.5 percent annually.

The differences in the level of change expected among the alternatives, as well as implications on compatibility between land uses, are described below.

Alternative 4—Preferred Alternative would create change more broadly than under Alternatives 3 or 2. Change to the higher density of MUR-85' is proposed north of the Shoreline Center site and MUR-45' west and northwest of Shoreline Center in Alternative 4 but not in Alternative 3 or 2. This change in land use pattern also may be more prominent in the subarea given that the geographic area north and northwest of the Shoreline center is higher in elevation than other areas.

The pattern of proposed zoning would result in appropriate transitions between land uses. For example, MUR-45' is typically located between MUR-85' and MUR-35' zoning. MUR-35' zoning is typically located between MUR-45' and single family zoning such as R-6. Even with these provisions, as change occurs throughout the subarea, there could be incompatibilities between new redevelopment and existing homes. Even though the underlying zoning would allow more density, single family use may continue in the MUR-35', MUR-45' and MUR-85' zoned areas. The City's development standards provide setbacks, landscaping requirements, and other provisions to provide buffers between land uses that would help to address these issues.

Alternative 4 provides the most capacity for growth and change, and as such offers the most flexibility to respond to market forces and property owners' willingness to redevelop or sell. This may help to create more transit-oriented development sooner than under alternatives that propose rezoning over less land area.

The Phase 1 zoning area would focus the amount of change in the next twenty years within the proposed boundary. Zoning

transitions would not necessarily occur with the initial adoption of the Phase 1 zoning area; although these eventually would be activated with adoption of all of the zoning of Alternative 4—Preferred Alternative. This could result in some MUR-85' and MUR-45' zoned land being redeveloped directly adjacent to land remaining in R-6 zoning over the next twenty years. As mentioned above, this condition would be expected anyway as the subarea builds out. Setback and landscaping requirements in the City's development standards would help to address transitions between these uses.

Because the Phase 1 zoning area would activate less land area with new zoning in the next twenty years, there would be less capacity for growth and change, which may limit redevelopment opportunities based on market forces and property owners' interests.

Alternative 3—Previous Most Growth proposes less extent of change than Alternative 4, but more than Alternative 2. However, more office and commercial use would be expected under Alternative 3 than under Alternative 4 or 2 based on the proposed zoning. Alternative 3 includes the same transitions in zoning as described above under Alternative 4 and it would require the same development standards. The same incompatibilities would be expected as described under Alternative 4 as the subarea redevelops. Alternative 3 would have less capacity and flexibility to respond to market conditions and property owners' interests than Alternative 4 since less land area would be rezoned.

Alternative 2—Some Growth would result in the least amount of change at build-out. The same incompatibilities could occur as redevelopment builds-out, but there would be less potential for this to occur since the overall level of change would be less. Alternative 2 would provide the least amount of capacity and flexibility for redevelopment opportunity given that it proposes rezoning of the least amount of land area.

Alternative 1—No Action retains existing zoning. However, ***"No Action" does not translate to "No Change" in the subarea.*** With the implementation of light rail, there would be greater demand for land uses in proximity to the station, particularly for housing. The current zoning for much of the subarea is R-6 (with the exception of the North City district on the east side of the subarea, which has a mix of commercial and multi-family uses and the Town Center area near Aurora Avenue on the west side of the subarea, which has a mix of commercial and employment uses). The R-6 zoning allows six units per acre. The average number of units per acre currently built in the subarea is 2.7. As such a substantial number of new housing units (more than double the current number) could be constructed over time in the subarea under the current zoning. Attached single family homes (such as duplexes, triplexes, and townhouses) and accessory dwelling units (attached or detached, maximum one per lot) are allowed in the R-6 zone if proposed redevelopment meets certain criteria (refer to Shoreline Municipal Code 20.40.510). The current maximum height for buildings in the R-6 zone is 35 feet.

Much of the housing stock in the subarea is reaching an age of 50 to 60 years or more, and some residents have made substantial renovations to their homes or have demolished existing homes to build new ones. This trend likely would continue under Alternative 1. With the anticipated demand for more housing that

will occur with light rail, as homesites are redeveloped in the subarea in the future (under Alternative 1—No Action), the community could expect to see either larger and taller single family homes or combinations of various types of attached multiple-unit single family buildings and accessory dwelling units.

Most homes in the subarea are currently one story or two stories in height (approximately 15 to 25 feet high). New residential buildings, including accessory dwelling units, could be constructed to a maximum height of 35 feet (approximately 3 to 3.5 stories). For comparative purposes, throughout north Seattle, there has been significant construction of this type over the last twenty years, which has changed the character of single family neighborhoods.

It is also important to note that redevelopment under Alternative 1—Not Action would not be consistent with the adopted vision for the light rail station area as a vibrant, equitable transit-oriented district. Single family redevelopment under the No Action Alternative would provide fewer opportunities for new affordable housing than proposed under Alternative 4, 3 or 2, as well as a significantly lower overall quantity of various types of housing to fit diverse income levels, and substantially less mixed use/neighborhood commercial at street level. Increased housing choice and affordability will be needed to serve the growing demand in the subarea over the long term.

Without zoning changes to require higher densities, single family home development would continue to be the focus in the subarea. Transit-oriented redevelopment opportunities, with a variety of housing choices and mixed use development, would not occur. While there could be some new development in the North City and Town Center subareas, these are located outside of the typical half-mile walking distance of the light rail station.

Opportunities envisioned for the redevelopment of the Shoreline Center and other sites (such as church parcels) would not be realized under this alternative since the existing R-6 zoning would remain in place. Investments in infrastructure and street improvements in the subarea would be very limited compared to the action alternatives.

Potential Built Form and Neighborhood Character

Each of the action alternatives proposes a mix of zoning under the MUR-85', MUR-45', and MUR-35' categories, along with retaining other existing zoning categories in the subarea. Each alternative has been modeled to show the expected built form (housing and development) that could result from implementation. Illustrations later in this section present simulated 3-D Sketch Up models for each alternative. These models conceptually illustrate the potential building form that could occur with full build-out of each alternative using the SketchUp model technique. The colors shown in the model graphics represent the MUR zoning designations described previously. Photographic examples of the built form/housing types that could be constructed under the new MUR zoning categories.

Renderings also have been developed show possible redevelopment concepts for various locations in the subarea and are presented later in this section, along with layout concepts of

how potential redevelopment could be configured adjacent to existing and new streets in the subarea. It should be noted that these illustrations are conceptual and represent a point in time of phased development that could occur over many decades in the future.

Building Heights

Alternative 4—Preferred Alternative proposes the most MUR-85' zoning of the action alternatives. The MUR-85' zoning allows a base height of 85 feet. A bonus height/density of up to 140 feet may be allowed for projects that meet special requirements through development agreements. Projects implemented through development agreements would be subject to a public process.

If development projects were to incorporate characteristics such as green building, additional affordable housing, public open space, and other amenities, they would have the ability to add bonus height/density to their projects, which could involve increases in height above the 85-foot level in all areas zoned MUR-85'. Population and household unit calculations in this FEIS assume this would occur over approximately 25 percent of the area zoned MUR-85' and buildings would not exceed 140 feet.

If over time the City observes a trend that could lead to more than 25 percent of buildings in height over 85 feet (and greater density), the City would need to conduct a supplemental environmental impact analysis to evaluate the potential impacts and reassess project and program needs to support the additional density.

Alternative 3—Previous Most Growth, also assumes that building heights of up to 140 feet would be allowable at the Shoreline Center site, but no other locations in the subarea. Alternative 4—Preferred Alternative changes this assumption, and instead assumes that the 140-foot building height could be implemented in any location zoned MUR-85' for a project that meets special requirements through a development agreement.

Market analysis has indicated that there may be minimal demand for mid-rise buildings in the subarea in the foreseeable future. However, over time this demand could grow. Zoning would preserve a broader range of possibilities for the subarea over the long term.

The MUR-85' zoning allows buildings in the construction type "5 over 2" translating to five stories of wood frame construction over two levels of a concrete podium base. The ground floor of this type of construction typically includes active uses along the street with parking behind the active uses and below grade. The second level can be housing, office, or commercial use, or in some case it can be structured parking. This is a common type of construction in the region for mixed use development. MUR-45' also allows mixed use development, which may include an active ground floor level along the street with typically three stories of housing above.

Active uses at the street level help to ensure a vibrant, walkable environment and typically include neighborhood retail uses and services.

MUR-35' also could include active use at the street level, but more often may consist of various types of low-scale multifamily

housing such as row houses, townhomes, live/work lofts, and other types of attached housing. MUR-35' would allow buildings of three to three and a half levels depending on the design.

In considering the costs of various types of building construction, buildings that are between eight levels to twelve levels are more challenging to finance due the cost of steel construction, but when a building can reach thirteen to fourteen levels, as could be the case with the 140' maximum height, it becomes a more financially feasible type of construction.

As previously discussed, under Alternative 1, there could be a change in character over time of larger, more expansive single family homes, even if no changes to zoning were made. Many current homes are one story to two stories in height. Up to 35-foot-high homes are allowed, so taller homes could be constructed over time. Also as mentioned previously, up to 6 units per acre are allowed under the current R-6 zoning. Because the current density is typically 2.7 units per acre in the subarea, property owners may choose to add more units over time. Accessory dwelling units and/or conversion and reconstruction of homes into duplexes and triplexes would be permissible if certain requirements are met by Code.

To summarize expectations related to building heights, under the action alternatives (Alternative 4, 3, or 2) allowable building heights in most areas would increase by approximately 0 (MUR-35') to 50 feet (MUR-85') compared to the 35-foot height limit under existing zoning. For approximately 25 percent of the area zoned MUR-85', building heights could be taller with development agreements. Alternative 4 proposes the greatest amount of MUR-85' zoning of the action alternatives. Also under Alternative 4, MUR-85' zoning is proposed in the area northwest of Shoreline Center, which is at a higher elevation and may be more prominent visually in the neighborhood.

Neighborhood Character

Alternative 4—Preferred Alternative would alter the neighborhood character more than the other alternatives at full build-out. Alternative 3—Previous Most Growth would result in less overall change than Alternative 4, but more than Alternative 2—Some Growth.

Over many decades, the subarea likely would transform from predominantly single family residential to a mix of housing types and neighborhood-serving retail and uses. Major redevelopment of the Shoreline Center site also could occur. While this would be a substantial change, the growth and related change would be expected to occur very gradually, similar to other urbanizing neighborhoods in the region such as Ballard, Green Lake, and Greenwood. Each phase of redevelopment would be evident as it occurs, but the overall level of change would be less perceptible than if it were to occur within a shorter timeframe. Mitigation measures including a variety of development standards and transitional zoning provisions are proposed to help buffer existing land uses from new redevelopment in the subarea.

With redevelopment, neighborhood character would change, but the subarea also would see positive enhancements, such as improved streets, intersections, and streetscapes, additional public spaces, parks, trails, and recreation facilities, and community benefits such as sidewalk cafes, public art, plazas, and

other amenities. Low impact development treatments such as rain gardens and stormwater planters would be envisioned as surface water management solutions. Regarding these positive changes to the neighborhood, Alternative 4 would result in the most amount of these over time than the other action alternatives due to the extent of redevelopment allowed.

Any of the action alternatives would be required to comply with the City's Historic Preservation Program, discussed earlier, as applicable.

Under Alternative 1—No Action, there would be minimal change to built form and neighborhood character. Streets, roadways, and public spaces would remain similar in character over the long term to today's conditions, although traffic congestion station subarea could become a growing problem due to a lack of roadway and intersection improvements.

Real Estate Speculation and Long-Term Predictability

Property owners have expressed concerns that real estate investors may be interested in purchasing single family homes and holding them as rentals until the time is right for redevelopment in the future. Many homeowners in both station subareas have already received letters offering fair market value, possibly because investors believe that properties will be less expensive before zoning changes or light rail service is operational. This type of speculative buying could occur regardless of whether or not the City was planning to rezone areas surrounding future stations immediately. One reason to implement zoning change sooner rather than later is to provide long-term predictability regarding what type of uses will be allowed where, and ample time for homeowners to become informed about the potential for change and determine their own long-range plans. For those that choose to sell, understanding the long-term potential of the property may allow them to capture additional value.

3.1.3 Mitigation Measures

Proposed Mitigation Measures

The City intends to amend its Comprehensive Plan to reflect the proposed alternative adopted through the subarea plan, and the City will adopt revisions to the Shoreline Municipal Code, including amendments to zoning provisions and development standards to support implementation of the subarea plan. These would occur under any of the redevelopment alternatives.

Capital project investment would be expected to increase over time to support anticipated growth, and as a result subarea residents would benefit from transportation and infrastructure improvements. The Capital Facilities Element of the Comprehensive Plan also would need to be updated at the next opportunity to reflect priorities for the subarea to support the proposed growth.

With the proposal to adopt the planned action, redevelopment would be able to proceed through streamlined environmental review as long as it is consistent with the planned action thresholds for growth for the next twenty years. The planned action threshold also provides a checkpoint for monitoring growth and change in the subarea. If more growth occurs than expected, the City would need to reevaluate the environmental

analysis in this FEIS and potentially implement additional mitigation measures.

As described earlier in this section of the FEIS and in Chapter 2, there are extensive policies already adopted by the City of Shoreline that would be supported by the subarea plan, regardless of which action alternative is implemented. Policies within the Shoreline Comprehensive Plan; Climate Action Plan, Environmental Sustainability Strategy, Economic Development Strategy, Transportation Master Plan; Parks, Recreation, and Open Space Plan; Town City Subarea Plan; North City Subarea Plan; and other adopted plans would be furthered and supported by redevelopment of the subarea.

Alternative 4—Preferred Alternative (and Alternative 3—Previous Most Growth or Alternative 2—Some Growth)

Retaining and enhancing neighborhood character is important to residents in the station subarea and required by City of Shoreline Comprehensive Plan policies and Shoreline Municipal Code provisions. It will be important that new higher density residential and mixed use land uses in the station subarea provide buffering and transition when located adjacent to single family uses. Some of the transitions would be accomplished through the proposed zoning frameworks as discussed previously. In addition, the City is preparing amendments to zoning provisions and development standards in the City's Code that would lead to improved neighborhood character and compatibility. Specific development regulations for the light rail station areas will be adopted. A brief summary of these anticipated provisions is provided below. For the full text of proposed amendments to the Code, refer to the planned action ordinance that will be adopted with the subarea plan.

- ***Development Agreements***—A new set of provisions is proposed allowing Development Agreements that would require specific elements from redevelopment projects in exchange for density/height increases. Elements such as affordable housing, green building standards, and structured parking would be required. Elements such as combined heat and power systems, provision of commercial uses, sidewalk cafes, provision of public open space, and other amenities would be encouraged.

- ***Affordable Housing—***Expanded provisions are being proposed for the Code to encourage and incentivize affordable housing as part of redevelopment projects.

- ***Mixed Use Residential and Live/Work—***Provisions related to mixed use residential development including additional requirements related to live/work units are proposed to encourage a vibrant transit-oriented community with a mix of housing and employment in proximity to the light rail station.

- ***Green Building—***Provisions are being developed to encourage green building and low impact development.

- ***Historic Preservation—***While no formally designated historic landmarks exist in the subarea, there are twelve parcels listed in the City's inventory that are potentially eligible. The mitigation for these potential historic

resources would involve a review of historic and cultural resources as part of redevelopment affecting those parcels and prescriptive measures to mitigate potential impacts to be developed by the City.

- ***Greater Flexibility in Use of and Conversion of Single Family Homes to Business and Office Use***—Code provisions would allow more flexibility for business and office use in existing single family homes and conversion of homes to exclusively business/office use.

- ***Light Rail Station and Park-and-Ride Design***—The light rail station project including the station and park-and-ride structure design would be subject to a specific agreement with the City that would establish design and implementation provisions for the light rail facilities.

- ***Community and Social Amenities, Heritage Commemoration, Cultural Opportunities, and Public Art***—As the neighborhood grows and changes gradually over time, there will be an increased demand for community amenities, such as public gathering spaces for events, senior facilities, community meeting rooms, farmers markets, community gardens, interpretation and heritage projects that commemorate Shoreline's history, public art, and other social cultural opportunities and events.

  These experiences for citizens and visitors are encouraged by City of Shoreline policies, and in addition, the City will consider potential regulatory provisions that would provision of these elements with redevelopment projects. Mitigation measures for parks, recreation, open space are addressed in Section 3.4 of the FEIS. Also, see Section 3.2 for additional discussion of mitigation measures related to Housing Choice and Affordability.

- ***Updated Development Standards***—A variety of amendments to development standards are proposed to reflect the new MUR zoning categories and to require and encourage specific elements such as:
  - Height limits (discussed previously in this section)
  - Front, rear, and side yard setbacks
  - Standards for transition areas, which include architectural step backs in the building design ("wedding cake" form), and landscaping requirements
  - Vehicular access oriented to side and rear rather than to the front along arterials
  - Traffic calming measures
  - Compatible architectural styles
  - Streetscape improvements and landscaping requirements
  - Open space and recreation facilities for residents
  - Parking quantity, access, and location standards
  - Reduced parking requirements in transit-oriented MUR zones
  - Shared parking, HOV, and EV parking encouraged
  - Vehicle circulation and access

- Good pedestrian access
- Bicycle parking facilities
- Lighting to enhance safety and security
- Building orientation to the street and transitions between buildings
- Design of public spaces
- Building façade articulation and compatible architectural form
- Covered access ways
- Preferences for architectural finishes and materials
- Preferences for fencing and walls
- Screening of utilities, mechanical equipment and service areas
- Land clearing, and site grading standards
- Tree conservation encouraged with residential redevelopment (but exempt from commercial and MUR-85' redevelopment)
- Signing requirements
- Integration of public art, planters, water features, and other public amenities

Other Recommended Mitigation Measures

- ***Exploring Partnerships—***In the near term, the City could explore potential public/private and public/public partnership opportunities in the subarea to help encourage and catalyze redevelopment. These could include partnering with the School District on redevelopment of the Shoreline Center site, including incorporation of a new multi-generational recreation/community facility. This also could include working with Sound Transit on the park-and-ride structure and potentially integrating other uses along its street frontage. Partnerships could include involvement in implementing affordable housing and community uses in the subarea.

- ***Proactive Capital Investments***—The City intends to proactively seek funding for transportation and infrastructure improvements in the subarea, which will help to support redevelopment and enhance neighborhood character.

3.1.4 Significant Unavoidable Adverse Impacts

Proposed redevelopment of the subarea under Alternative 4—Preferred Alternative would result in substantial changes in neighborhood character over time. Intensification of development and higher buildings would occur incrementally. While the intensity of redevelopment in this area would be substantially greater than existing conditions, the new redevelopment would be consistent with the Shoreline Comprehensive Plan, and other local, regional, state, and federal plans and policies. Additional housing and employment opportunities would be created, and it is anticipated that a variety of positive neighborhood benefits would result through redevelopment.

Implementation of the planned action will set a threshold for growth and development in the subarea for the next twenty years that aligns with an expected level of capital improvements and investments to support the growth. This will allow the City to monitor change and would trigger additional environmental review if change occurs at a more aggressive pace than anticipated.

Keeping in mind that change in the subarea would be expected to occur gradually, over may decades, it is not anticipated that there would be significant unavoidable adverse impacts that could not be addressed through the mitigation measures discussed above and the City's ongoing proactive monitoring of conditions in the subarea.

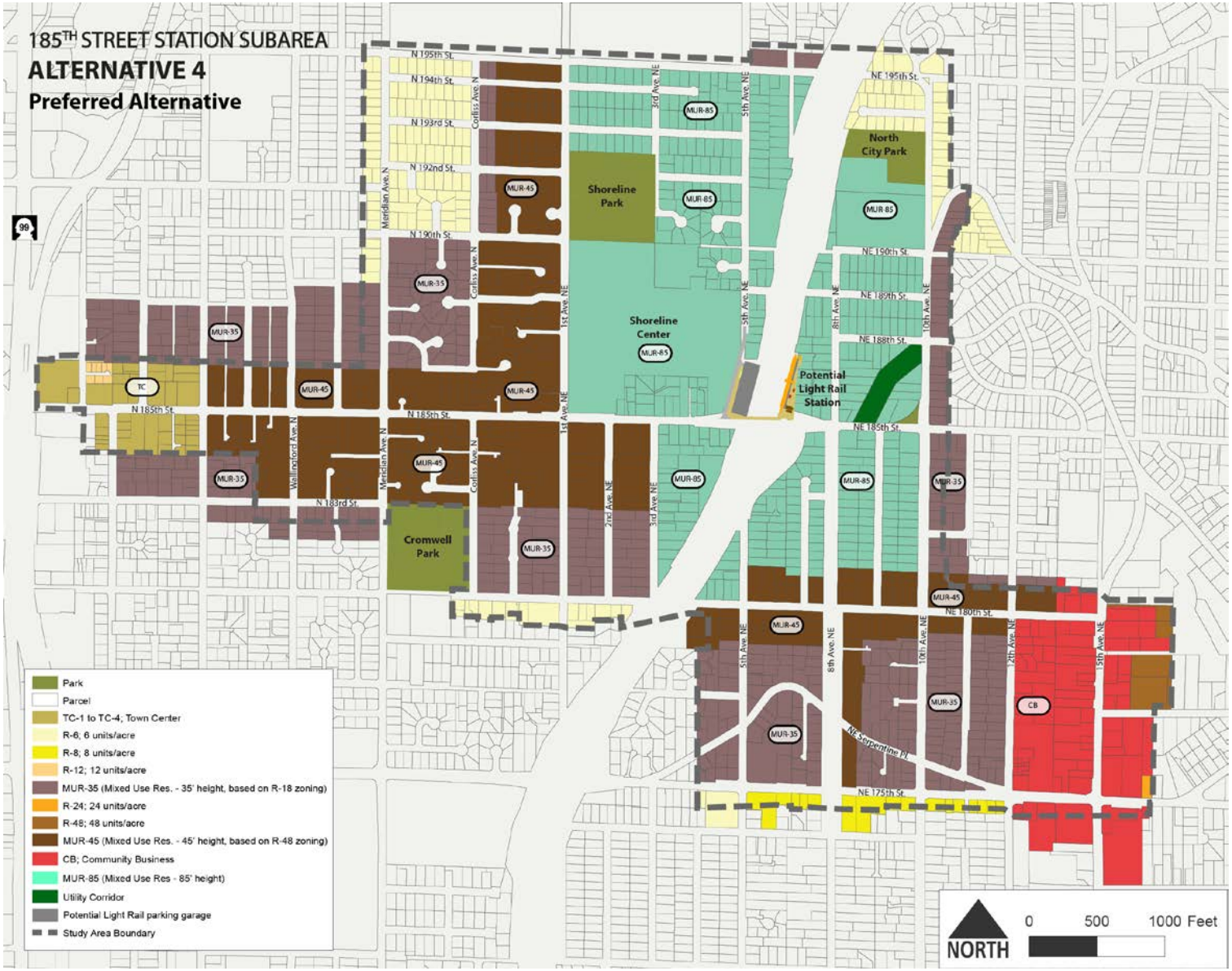


Figure 3.1-4 Alternative 4—Preferred Alternative, Proposed Zoning Map

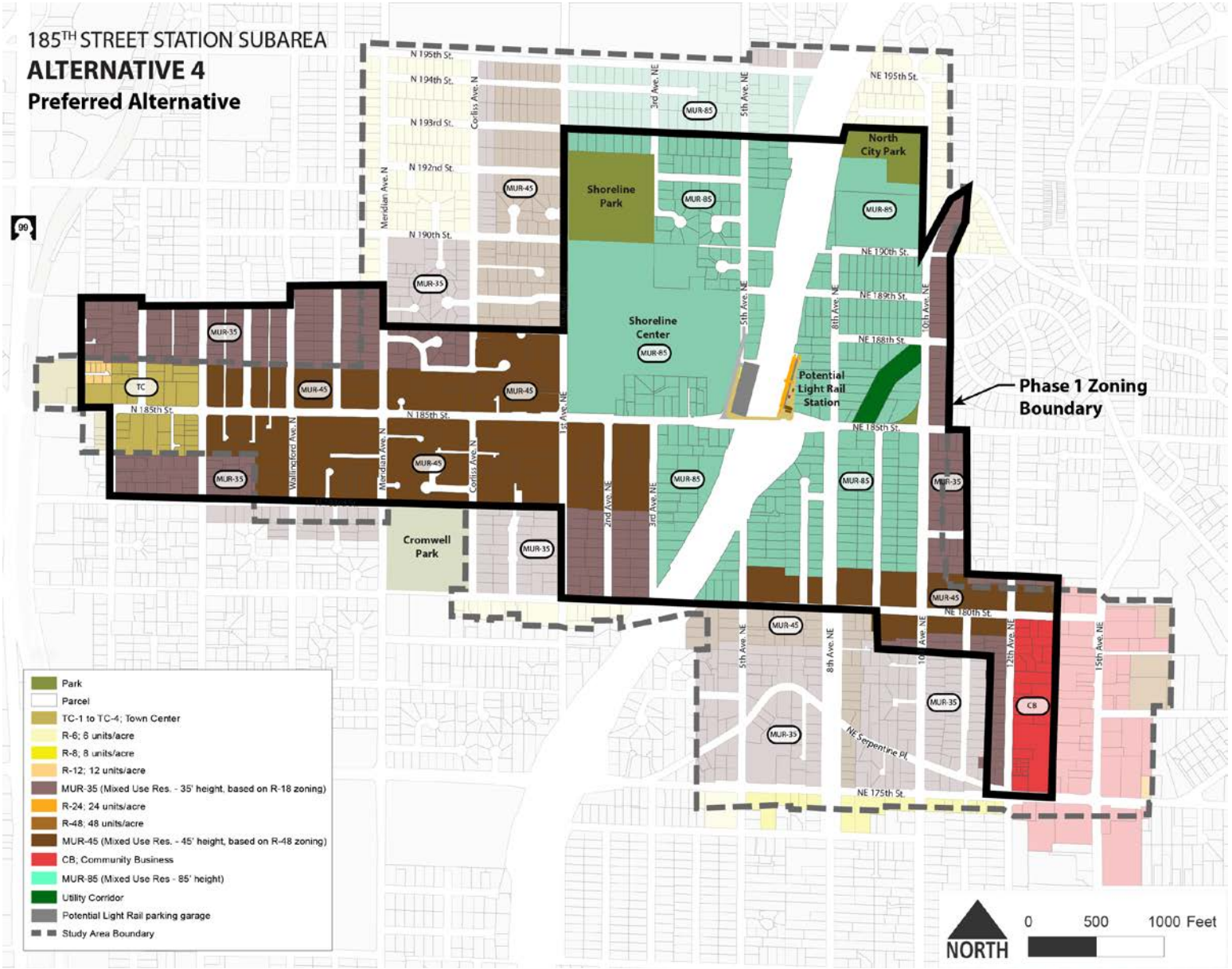


Figure 3.1-5 Alternative 4—Preferred Alternative, with Potential Phase 1 Zoning Boundary (If Phased Zoning is Adopted)

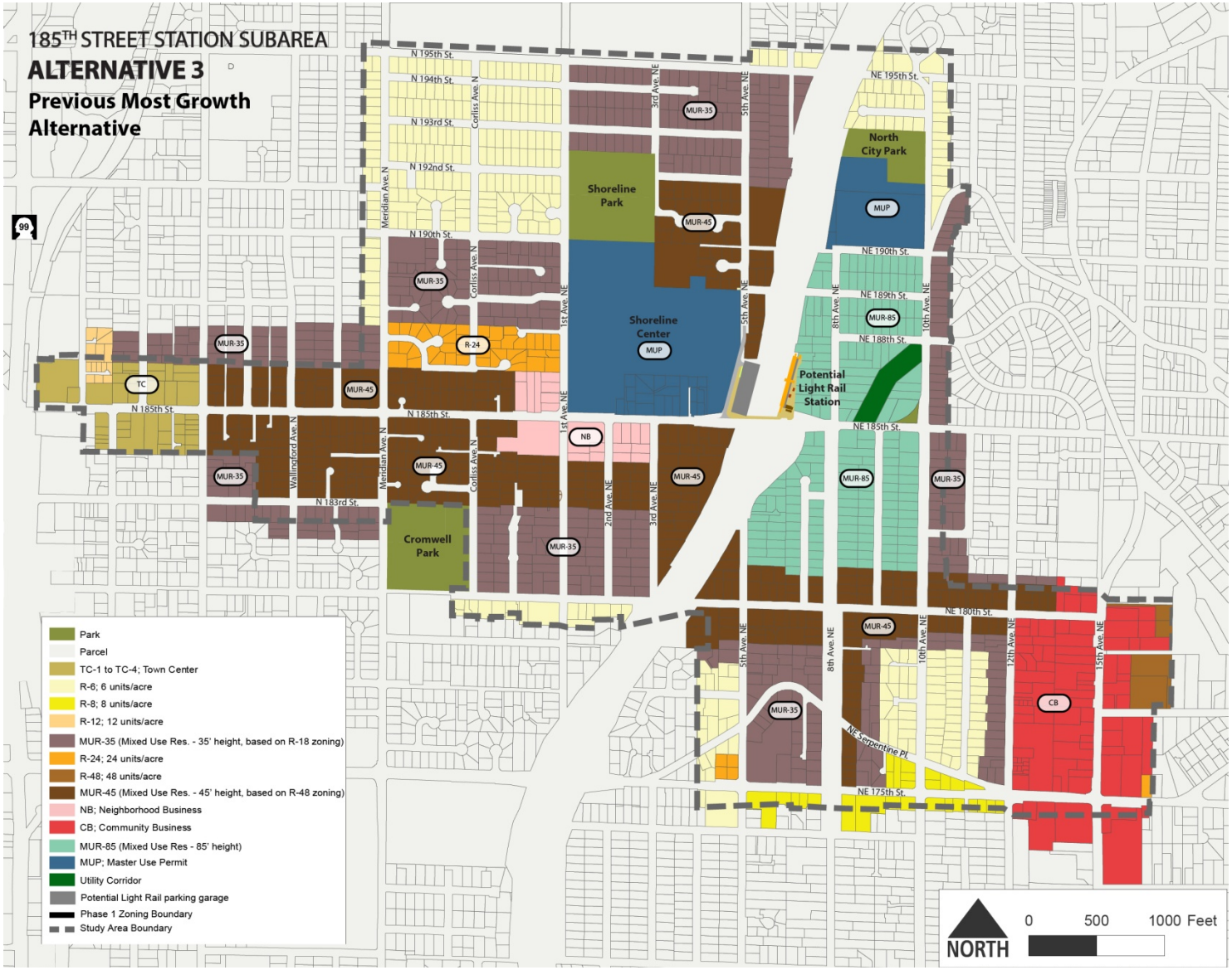


Figure 3.1-6 Alternative 3—Previous Most Growth Zoning Map

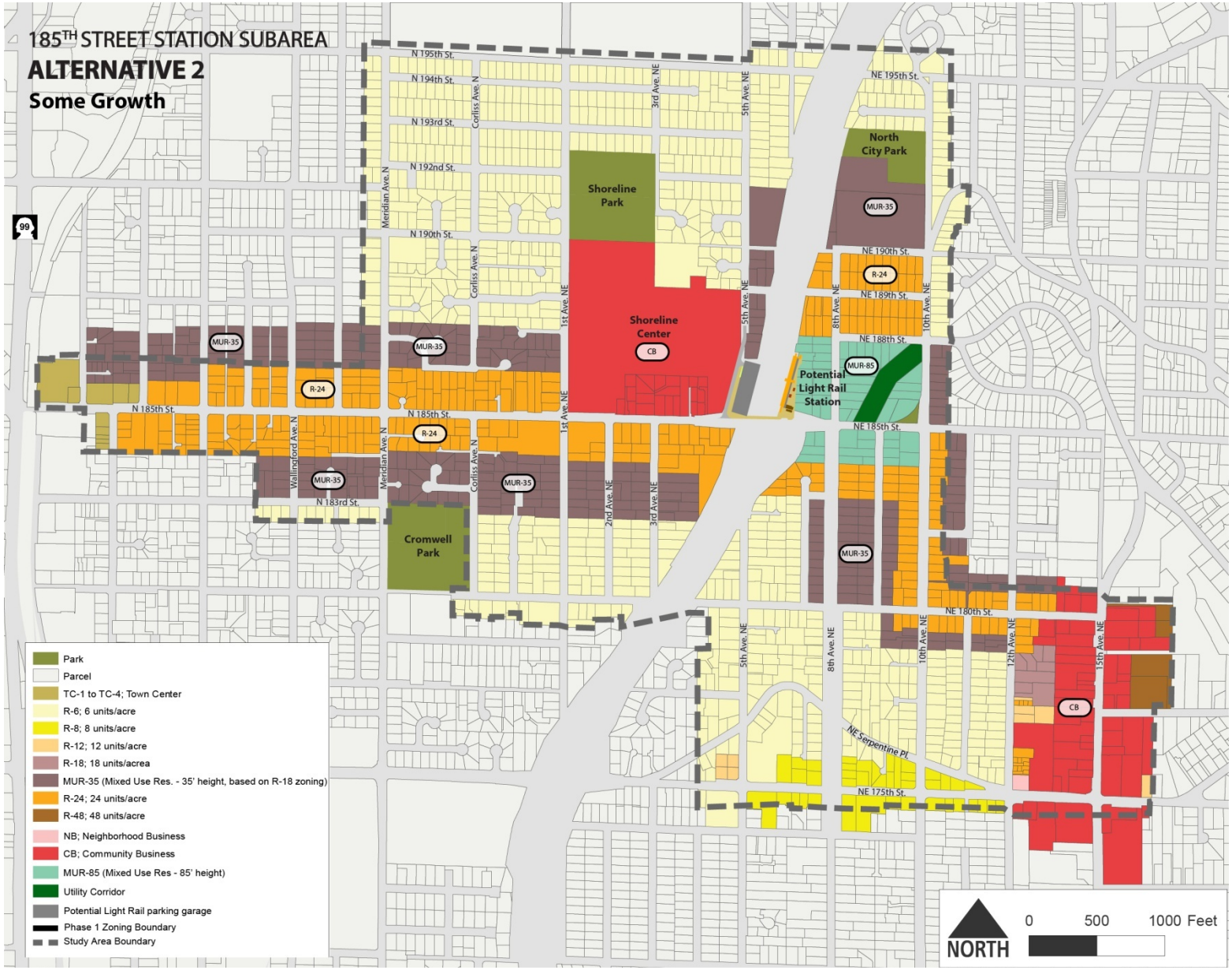


Figure 3.1-7 Alternative 2—Some Growth Zoning Map

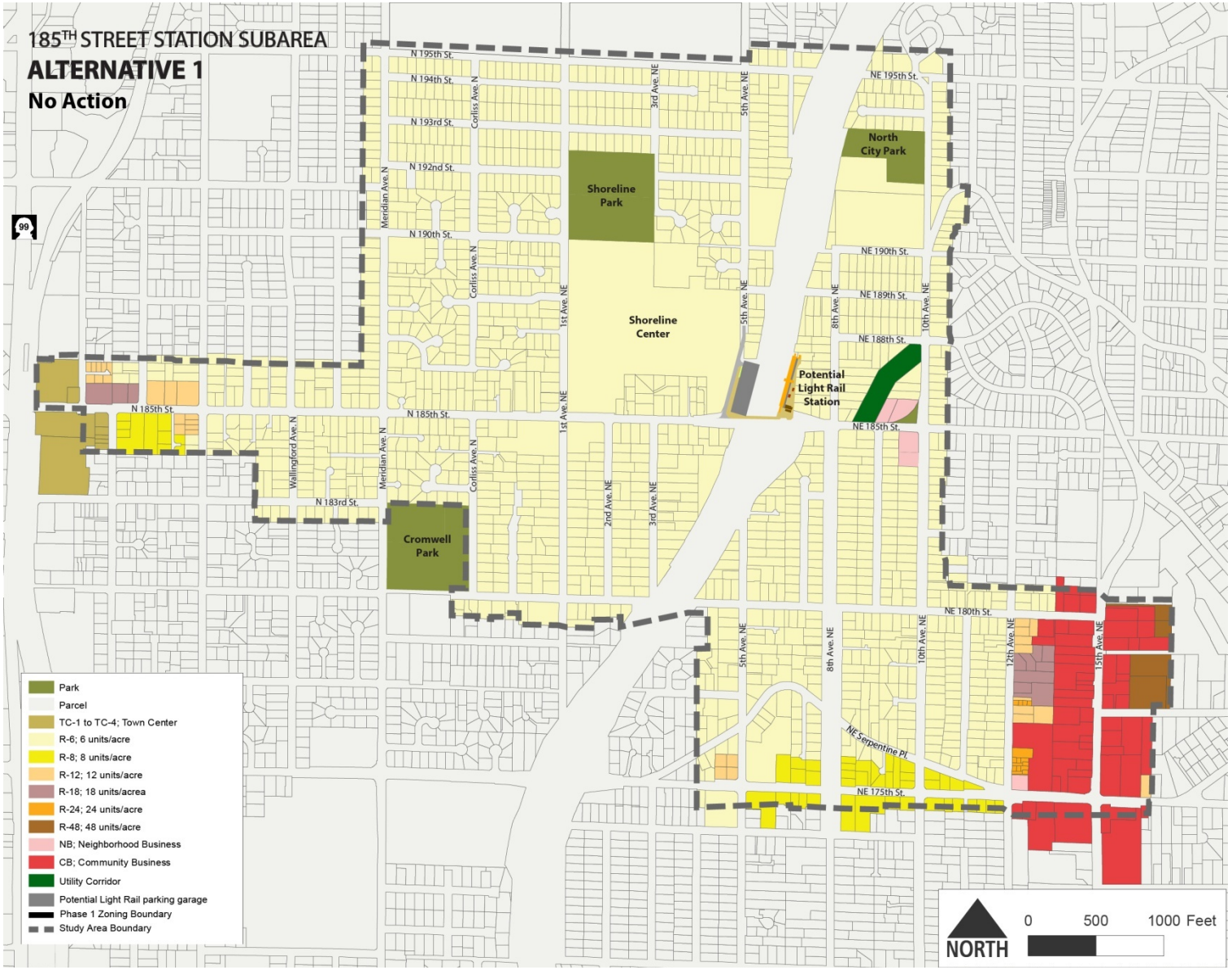


Figure 3.1-8 Alternative 1—No Action, Existing Zoning Map

MUR 85

MIXED-USE RESIDENTIAL—85 FOOT HEIGHT LIMIT: This zone would allow building heights of 85 feet (generally 7 stories tall). Building types would typically be mixed use with residential and/or office uses above commercial or other active use at the ground floor level. It should be noted that this density is unlikely to be supported by current market forces, and as such, it may be some time before this building type would be developed in the subarea.

Example Housing Styles-MUR-85' Zoning Designation

MUR 45

MIXED-USE RESIDENTIAL—45 FOOT HEIGHT LIMIT: Similar to the existing zoning category R-48 that allows 48 dwelling units per acre, this zone would allow multi-family building types. The height limit for MUR-45 would be 45 feet (differing from the height limit of R-48, which currently varies from 40 feet if adjacent to single family zones, 50 feet if adjacent to multi-family zones, and 60 feet with a Conditional Use Permit). Because building heights have been identified through public involvement as a concern in the station subarea, the new MUR-45 zone would be limited to 45 feet regardless of adjacent zoning, which equates to a 4-story building. The MUR-45 zone would allow housing styles such as mixed use buildings with three levels of housing over an active ground floor/commercial level. Buildings such as row houses, townhomes, live/work lofts, professional offices, apartments, etc. also could be developed in MUR-45, and single family homes could be converted to commercial and professional office uses like in MUR-35.

Example Housing Styles-MUR-45' Zoning Designation

Example Housing Styles-MUR-35' Zoning Designation

Sketch-Up Model View for Alternative 4—Preferred Alternative, Looking Westward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 4—Preferred Alternative, Looking Eastward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 3—Previous Most Growth, Looking Westward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 3—Previous Most Growth, Looking Eastward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 2—Some Growth, Looking Westward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 2—Some Growth, Looking Eastward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 1—No Action, Looking Westward toward the Potential Light Rail Station

Sketch-Up Model View for Alternative 1—No Action, Looking Eastward toward the Potential Light Rail Station

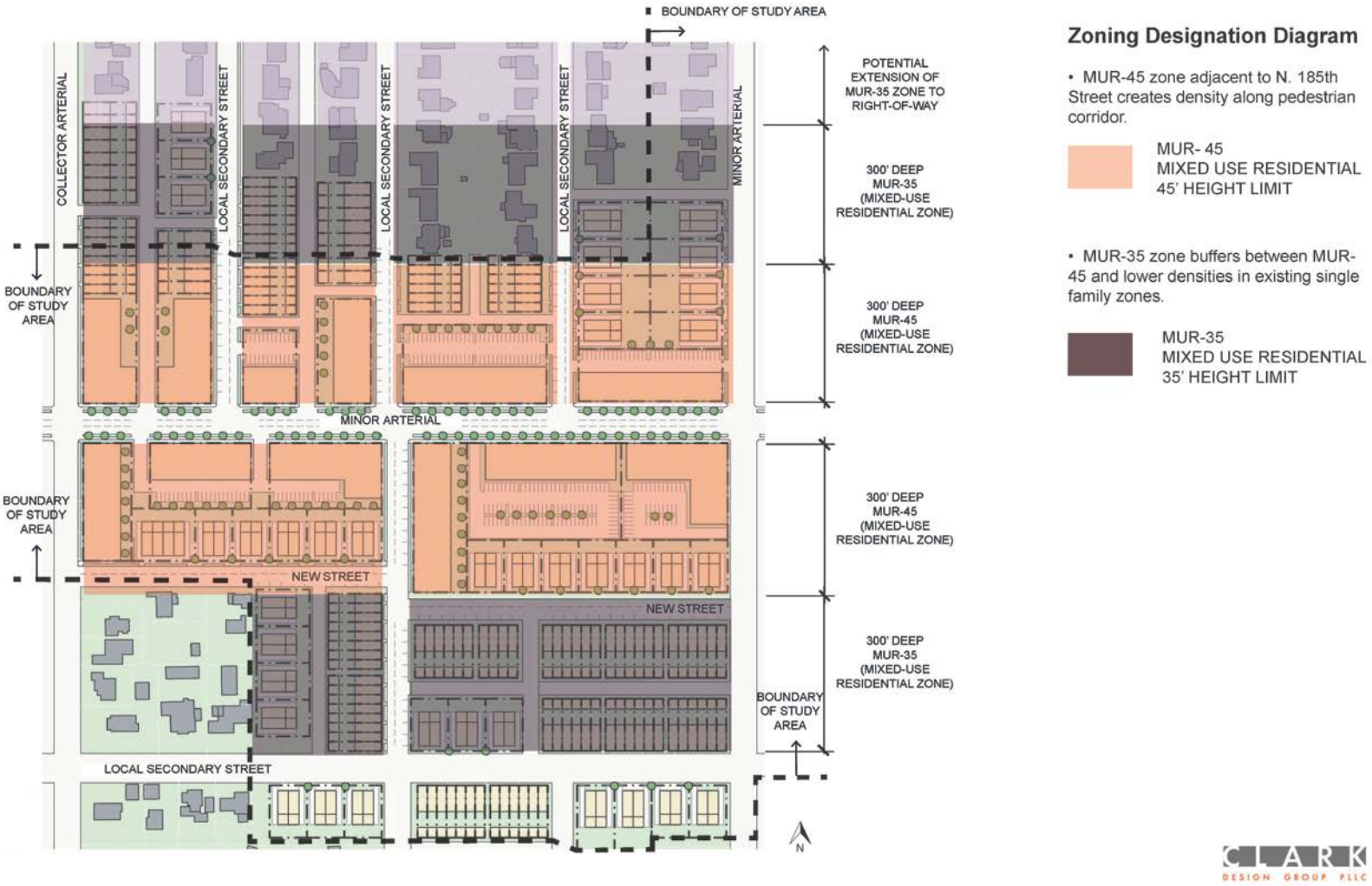
Conceptual possibility for N-NE 185th Street multimodal improvements, looking west

Conceptual possibility for the N 185th Street overpass, looking eastward, with solar panels and green roofs on the canopies

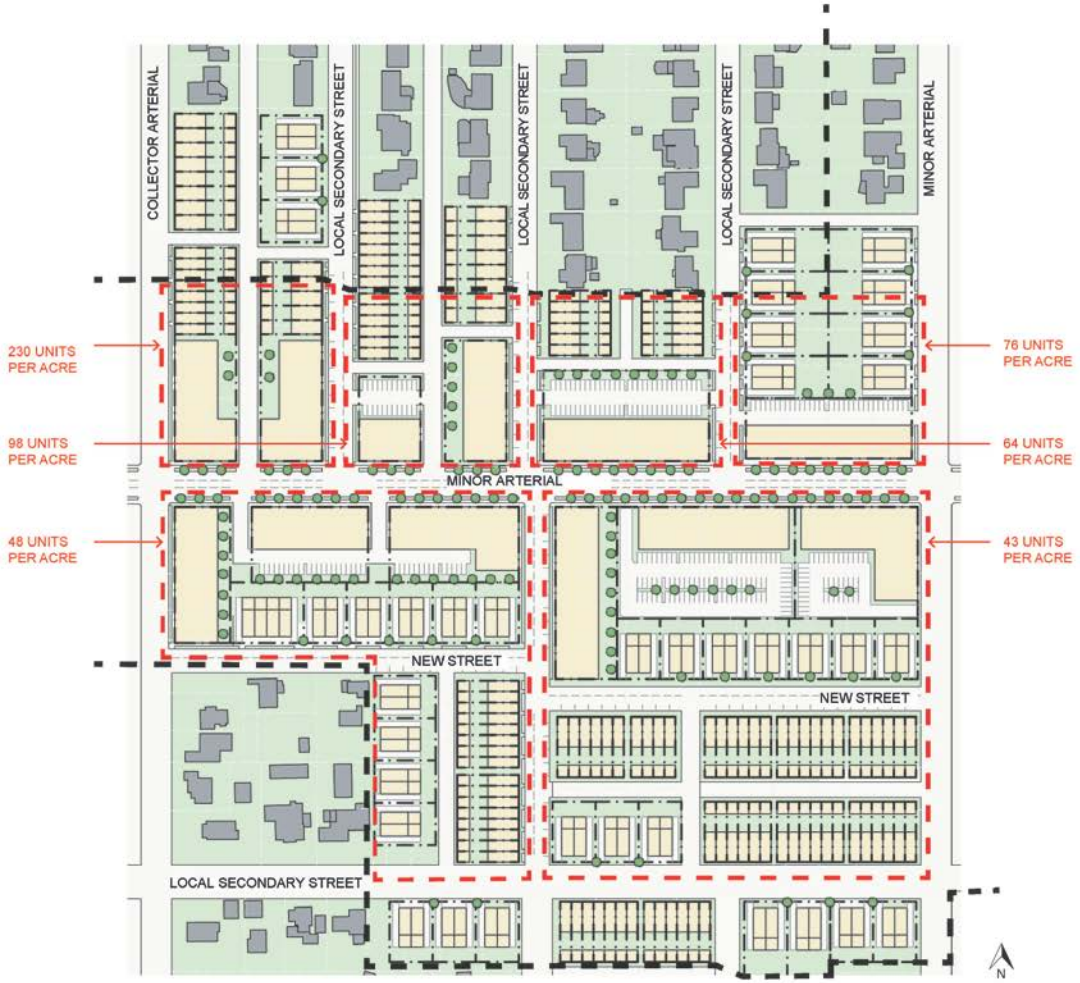
Conceptual possibility for sheltered crossing area at the N 185th Street overpass, looking eastward

Possible layout concept for redevelopment in the subarea showing MUR-45' zoning

Possible layout concept for redevelopment in the subarea showing MUR-35' zoning



Possible redevelopment concept showing MUR-45' and MUR-35' zoning



Density Diagram

- Diagram illustrates potential densities that can be achieved with 4-story mixed-use residential buildings along N. 185th Street and 2-3 story row and townhouses located one block off of N. 185th Street.
- Row and Townhouses reduce height of buildings while achieving range of 10-24 units/acre.

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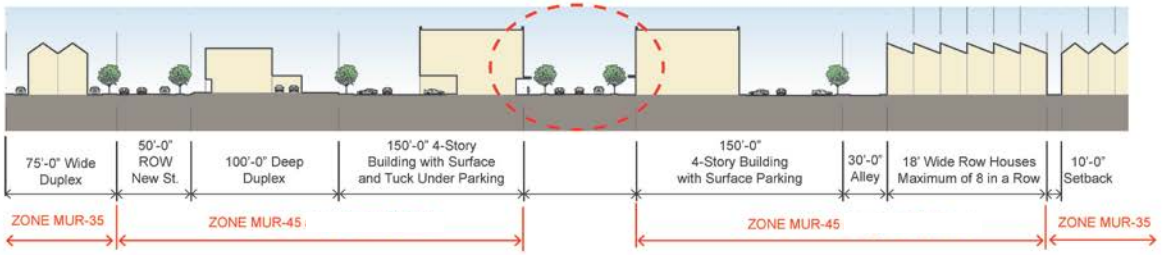
Conceptual layout possibility illustrating potential density with MUR-45' and MUR-35' zoning

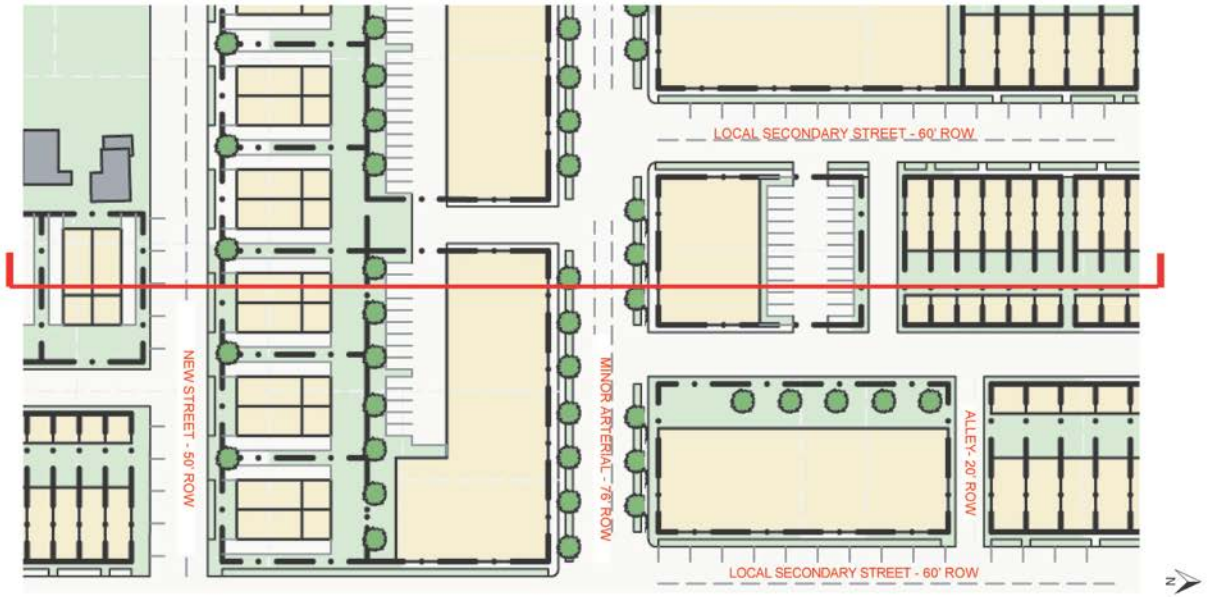
CITY OF SHORELINE

Conceptual layout possibility showing various housing types and duplex and row house redevelopment as the transition between MUR-45' zoning and single family



Section Diagram

- MUR-45 zone adjacent to N. 185th Street creates density along pedestrian corridor.
- MUR-35 zone buffers between MUR-45 and lower densities in existing single family zones.



CLARK DESIGN GROUP PLLC

Conceptual layout plan and cross section view showing parcel depths with MUR-45' and MUR-35' zoning

CITY OF SHORELINE

Conceptual possibility for the 8th Avenue NE right-of-way, looking southwest, with shared use path, community gardens, and public spaces with MUR-45' and MUR-35' zoning; while the shared use path would be a longer-term improvement, it would help to increase bicycle connectivity in the subarea

Conceptual possibility for transit-oriented development on the east side of the proposed light rail station, looking northwest, with the power transmission lines at center of the block in open space use

Conceptual possibility for the NE 180th Street, looking southeast, public art commemorates the nearby NE 185th Street "Motorcycle Hill" history of subarea; MUR-85' building example at the corner

Conceptual possibility showing mixed use redevelopment on a portion of the Shoreline Center site, looking southward, farmers market could occur on an extension of N 190th Street as a shared use community "festival street"; up to five and six story building examples

3.2 Population, Housing, and Employment

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures for population, housing, and employment.

3.2.1 Affected Environment

Shoreline has been traditionally known as a great place to live in the central Puget Sound region, based on the strong sense of community, good schools, and many parks and recreation opportunities provided throughout the city.

Existing Population and Trends

Shoreline's overall estimated population in 2013 was 54,790 based on information recently released by the US Census Bureau. An estimated 7,944 people live in the 185th Street Station Subarea, approximately 14.5 percent of the city's population. (Note: population is based on subarea boundaries that extend to the outer boundaries of the Traffic Analysis Zones of the subarea. See discussion on page 3-68.)

Shoreline's population increased in the 1980s and 1990s but remained fairly stable between 2000 and 2010. Although the total population of Shoreline did not increase substantially up to 2010, the city has grown an average of slightly over 1 percent per year since 2010 based on US Census Bureau estimations.

In review of the demographic composition of the population, two trends are occurring, including greater race/ethnic diversity and aging of Shoreline's population. The largest minority population is Asian-American, composed of several subgroups, which collectively made up 15 percent of the population as of the 2010 Census. The African-American population, comprising 2,652 people, had the largest percentage increase, at 45 percent between 2000 and 2010, followed by people of two or more races, at 15 percent. Hispanics may be of any race, and this demographic increased 41 percent to 3,493. Additionally, foreign born residents of Shoreline increased from 17 percent of the population to an estimated 19 percent by 2010, as measured by the American Community Survey.

The median age of community residents increased from 39 in 2000 to 42 in 2010. "Baby Boomers", those born between 1946 and 1964, comprise approximately 30 percent of the population. Shoreline has the second largest percent of people 65 and older among King County cities, at 15 percent. Among older adults, the fastest growing segment is people 85 and older, up one-third from 2000.

Families (two or more people related by birth, marriage, or adoption) declined from 65 percent to 61 percent of all households in Shoreline between 2000 and 2010. Non-family households increased from 35 percent to 39 percent of households. The number of people living in group quarters, such as nursing homes, adult family homes, and Fircrest increased by 9 percent between 2000 and 2010 based on the 2010 Census.

Population Growth Trends and Forecasts

The central Puget Sound region is one of the fastest growing metropolitan areas in America. Seattle, Shoreline's neighboring city to the south, grew faster than any other major American city in 2013, according to the US Census Bureau, with approximately 18,000 people moving to the city in the one-year period. Seattle

is the 21st largest city in the US. Seattle's growth rate from July 1, 2012 to July 1, 2013 was 2.8 percent, the highest rate among the 50 most populous US cities, bringing the total 2013 population to 652,405. From July 1, 2012 to July 1, 2013, the Seattle-Tacoma-Bellevue metropolitan area ranked tenth in numerical population growth of metropolitan areas of the US, adding 57,514 people. According to Puget Sound Regional Council's 2040 Transportation Plan, our region will add 1.4 million people and 1.1 million jobs by 2040.

Washington State's overall population is currently 6,951,785 and is forecasted to grow by just above 1 percent per year through 2025 and then at less than 1 percent per year through 2040 according to the Washington State Office of Financial Management.

In looking at growth rates of regional cities, most communities in the Puget Sound region have grown at various rates, between less than 1 percent, to about 3 percent annually between 2010 and 2013.

In a review of other transit-oriented districts around light rail and high-capacity transit in the US, growth rates have varied greatly. However, average annual growth rates of around 2 percent are often achieved, but are influenced by a variety of factors.

Based on recent information released by the US Census Bureau, the 15 fastest growing cities in America with populations of 50,000 and larger (similar to Shoreline's size) grew between 3.8 percent (Pearland, Texas) and 8 percent (San Marcos, Texas) between 2012 and 2013.

While Shoreline's population was stable with little growth up to 2010, the population of the community is expected to continue to grow as more housing and employment opportunities are developed. Seattle and other regional cities also are forecasted to continue to grow over the next couple of decades.

The growth potential for the 185th Street Station Subarea is high; however, it is moderated by potential challenges related to redevelopment, such as the need to aggregate parcels to create sites large enough for mixed use and multifamily housing, as discussed in section 3.1. Uncertainty about the market and property owners' interests in redeveloping or selling their properties also moderates the forecast for growth.

With all of these considerations, the anticipated average annual growth forecasted for the subarea is around 1.5 percent to 2.5 percent. This is the assumed growth rate for purposes of subarea planning and environmental analysis.

Capacity Building for the Future and Focus of the Planned Action

Given the considerations discussed above, it is important to recognize that the 185th Street Station Subarea Plan will be a long-range plan to be achieved over generations. It will be a plan that creates capacity and opportunity for redevelopment over the long term for current and future generations of residents in the subarea. Proposed rezoning allows flexibility for redevelopment to occur in a variety of locations in the subarea based on property owners' interests and development market influences. While the 185th Street Station Subarea Plan will set the vision for what could occur over the long term, it also will define capital improvement and project priorities to support potential redevelopment over the next 20 years, which is the established planning horizon. The plan will address anticipated phasing and locations of redevelopment and make specific recommendations for public investment in the subarea to support this first stage of growth.

In order to align the Planned Action with the 20-year planning horizon of 2035, 20-year growth targets have been set for the Preferred Alternative. These are discussed later in this section and elsewhere in this FEIS.

Assigned Growth Targets for Shoreline

The King County Countywide Planning Policies (CPPs), adopted to implement the Growth Management Act (GMA), establish household growth targets for each jurisdiction within the county. Each target is the amount of growth to be accommodated during the 2006-2031 planning period. Shoreline's growth target for this period is 5,000 additional households; projected to 5,800 households by 2035 (200 households per year).

Applying Shoreline's current average household size of 2.4 people per residence, 5,800 new households equates to 13,920 new residents by 2035. Another recent target set by Puget Sound Regional Council (PSRC) calls for Shoreline to gain more than 7,200 new jobs by 2035, improving its jobs-to-housing ratio to 0.91. (Note: jobs-to-housing ratio and balance are discussed and defined later in this section.)

The City is required to plan for its assigned growth target and demonstrate that its Comprehensive Plan is able to accommodate the growth targets for households and employment. Sufficient land (zoning capacity) and strategies must be in place to show that there will be available housing and services for the projected population. The City of Shoreline has met these requirements through its Comprehensive Plan, which shows that growth targets can be met through citywide increases in housing and employment.

Although the city has capacity to meet these growth targets with or without upzoning the station subarea, intensifying densities in proximity to the light rail station is smart growth, consistent with regional goals and policies, as well as those adopted by the City.

With more people living and working near high-capacity transit, Shoreline can better achieve the objectives of the Climate Action Plan and better meet the policies and provisions of the Comprehensive Plan and Transportation Master Plan. Adopted policies related to expanding housing and transportation choices and enhancing quality of life through better connectivity in the station subarea also can be realized.

The proposed zoning and proximity to high-capacity transit also could help to catalyze redevelopment and encourage higher rates of growth in the subarea than are currently being experienced citywide and regionally. A review of growth rates over the last ten years shows that the City has only recently been barely keeping pace with the growth target of 200 households per year within the last couple of years and is not yet meeting the jobs/employment growth target range.

Allowing for more dense growth near transit would take the pressure off single-family neighborhoods to accept additional households. New housing in the subarea would and should include transit-supportive densities. This would be accomplished through various types of multifamily and transit-oriented development (mixed use buildings, condominiums, apartments, townhomes, etc.) allowed under the proposed MUR-85' and MUR-45' zoning categories. Attached single-family homes, cottage housing, accessory dwelling units, duplexes, triplexes, and other multiplexes would be expected to develop as a result of the proposed MUR-35' zoning, and this area would serve as a transition between the more intensive density in the station

vicinity and the traditional detached single family neighborhoods in outer areas.

Refer to Section 3.1 for a more detailed explanation of expected urban form and neighborhood character.

Redevelopment Potential and Timing

The potential for growth and timing of redevelopment would be influenced by various factors in the subarea, including development market factors and individual property owner decisions on the use of their properties. The largest site for redevelopment opportunity being the Shoreline Center. Although the Shoreline School District has no current plans for redevelopment of the site, proposed upzoning under Alternative 2—Some Growth, Alternative 3—Previous Most Growth, and Alternative 4—Preferred Alternative would maximize opportunities for future redevelopment. The Preferred Alternative would provide the most overall opportunities for growth, redevelopment, and economic development.

The North City school site is another opportunity site in the subarea. The School District has no plans for redevelopment of the site, which currently houses preschool and homeschooling facilities. Consistent with the District's policies, the current site functions are valuable to the neighborhood and the potential need for a future neighborhood school to serve increased population/households reinforces the importance of this site as a long term place of education. Also, with the anticipated growth of the subarea as a result of upzoning, there would be a need for new schools to serve new households in the coming decades, and this site could help in addressing that need.

There are several church parcels of larger size that would be suitable for additional growth in the near term, if property owners are interested in redeveloping and incorporating additional uses and development onto their site, or are willing to sell to an interested developer.

Most other properties within the subarea are smaller sized single family residential lots and would need to be aggregated into larger parcels to create an overall size suitable for redevelopment to the proposed zoning. As such, throughout the FEIS analysis, it is stated that growth in the subarea would be anticipated to occur very gradually over many decades. As an example, even if the higher annual growth rate of 2.5 percent were to occur, it is estimated that it would take approximately 80 years to reach full build-out of Alternative 4—Preferred Alternative, and it would take at least 125 years to reach full build-out at a 1.5 percent annual growth rate.

Population Study Area for Purposes of the Subarea Plan and FEIS

While the subarea plan is focused on the study areas shown in Figures 1-1 and 1-2 in Chapter 1, for purposes of population and employment projection calculations the limits of Traffic Analysis Zones (TAZ) boundaries are assumed as the study area. In some cases, these boundaries extend beyond the land use and mobility study area boundaries designated for the subarea, and overall the area covers a broader geography. TAZs are the common methodology for analyzing demographics regionally in planning.

TAZs for the study area are depicted in **Figure 3.2-1**. It is important to note that the population figures throughout this FEIS (existing and forecasted) relate to the areas shown in this TAZ map, beyond the land use and mobility (multi-modal transportation) study area boundaries. The existing estimated population within the 185th Street Station Subarea, including the TAZs associated with the subarea is 7,944. Population within these TAZs has been a key factor in calculating potential impacts

and demand for transportation, public services, utilities in this FEIS.

Recent plans for the Point Wells area have been presented by Snohomish County, which is going through a separate environmental impact analysis process to assess redevelopment opportunities. While potential population growth for Point Wells would occur outside the 185th Street Station Subarea, projected traffic in the subarea as a result of Point Wells development is assumed in this FEIS, as described and analyzed in Section 3.3 Multimodal Transportation.

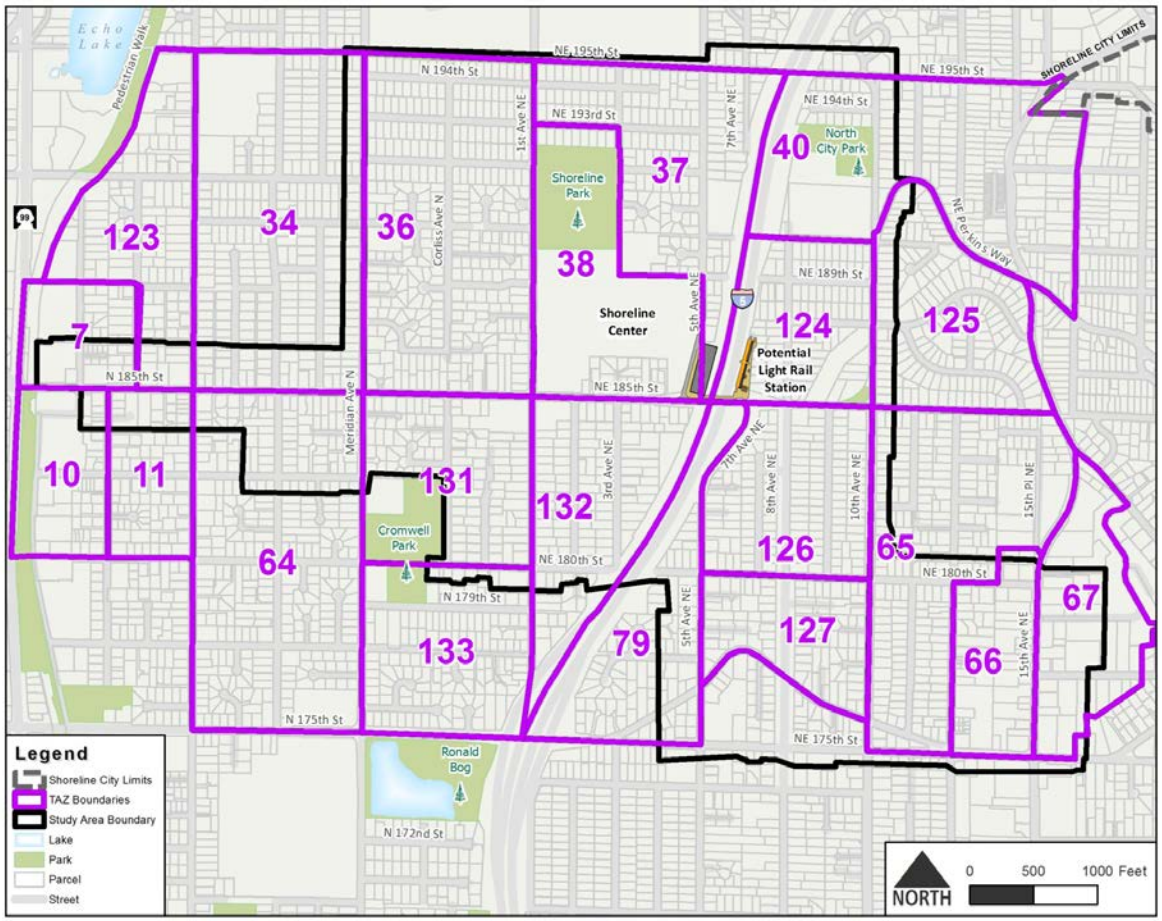


Figure 3.2-1 Traffic Analysis Zones (TAZs) in Proximity to 185th Street Station Subarea, Referenced for Population Calculations

Existing and Planned Housing and Household Characteristics

Planning for expected growth requires an understanding of current housing and household characteristics, as well as economic and market trends and demographics. A summary of the market assessment and economic trends was provided in Section 3.1. Below is a summary of current housing and household characteristics in Shoreline including conditions related to affordability. Much of the information presented is based on the supporting analysis in the 2012 Comprehensive Plan for the City of Shoreline.

Comprehensive Housing Strategy

The demand analysis and housing inventory developed to support the Housing Element of the 2012 Comprehensive Plan meets the requirements of the Growth Management Act (GMA) and Countywide Planning Policies (CPPs) and complements past planning efforts, including the City's Comprehensive Housing Strategy, adopted by Council in February 2008.

The Comprehensive Housing Strategy was the culmination of work by a Citizen Advisory Committee formed in 2006 to address the city's housing needs. The strategy contains recommendations for expanding housing choice and affordability while defining and retaining important elements of neighborhood character, educating residents about the importance and community benefit of increasing local choice and affordability, and developing standards to integrate a variety of new or different housing styles within neighborhoods.

Shoreline and Subarea Housing Inventory

Shoreline can be classified as a historically suburban community that is maturing into a more self-sustaining urban environment. Almost 60 percent of the current housing stock was built before 1970, with 1965 being the median year of home construction. Only 7 percent of homes (both single and multi-family) were constructed after 1999. Much of the housing stock is approaching 70 years of age and most is over 50 years old. More and more homeowners are either making substantial renovations to their homes or demolishing existing homes and replacing with new ones. This trend would likely continue absent upzoning in the subarea.

Over the last decade, new housing was created through infill construction of new single-family homes and townhouses, with limited new apartments in mixed-use areas adjacent to existing neighborhoods. Many existing homes were remodeled to meet the needs of their owners, contributing to the generally good condition of Shoreline's housing stock.

The characteristics of the 185th Street Station Subarea are consistent with these described for Shoreline overall, although the subarea has seen less infill construction and redevelopment activity than other areas of the city.

Quantity of Housing Units, Types, and Sizes

Single-family homes are the predominant type of existing housing and encompass a wide range of options, which span from older homes built prior to WWII to new homes that are certified through the Leadership in Energy and Environmental Design (LEED) program. Styles range from expansive homes on large view lots to modest homes on lots less than a 1/4 acre in size. In the station subarea, the predominant single family lot size is 8,000 to 10,000 square feet, and although much of the existing zoning in

the subarea is Residential, six units per acre (R-6), the current built density of the subarea is approximately 2.7 units per acre.

According to the 2010 Census, there were 21,561 housing units within the City of Shoreline, an increase of 845 since 2000. About 73 percent of these housing units are single-family homes. Compared to King County as a whole, Shoreline has a higher percentage of its housing stock in single-family homes. **See Table 3.2-1**. In the 185th Street Station Subarea, including the TAZs associated with the subarea, it is estimated that there are currently 3,310 households.

While there are an increasing number of households in Shoreline each year, population levels indicate a potential trend toward a decrease in household size. This is consistent with national trends. However, overall in King County, household size has remained stable since 1990 (see **Table 3.2-2**). Shoreline's average household size is currently 2.4 people per dwelling unit.

In Shoreline, the average number of bedrooms per unit is 2.8. Only 16 percent of housing units have less than 2 bedrooms. This compares with 21 percent of housing units with less than 2 bedrooms in King County. With larger housing units and a stable population, overcrowding has not been a problem in Shoreline.

The US Census reported only 1.6 percent of housing units with an average of more than one occupant per room, and no units that averaged more than 1.5 occupants per room (American Community Survey 2008-2010).

Affordable Housing Metrics for Shoreline

To understand affordability metrics, percentages of Area Median Income (AMI) are calculated. For example, The 2011 AMI for Shoreline was $66,476. Therefore, a household with that income would be making 100 percent of median; a household that made 50 percent of that amount ($33,238) would be classified at 50 percent AMI; a family making 30 percent of that amount ($19,943) would be classified at 30 percent AMI.

Families that pay more than 30 percent of their income for housing are considered "cost-burdened" and may have difficulty affording necessities such as food, clothing, transportation, and medical care.

Definition and Measure of Housing Affordability

The generally accepted definition of affordability is for a household to pay no more than 30 percent of its annual income on housing. When discussing levels of affordability, households are characterized by their income as a percent of the Area Median Income (AMI). The box above highlights information pertaining to affordable housing metrics in Shoreline. **Figure 3.2-2** shows wage/income levels for various professions.

Table 3.2-1 Number of Dwelling Units for Each Housing Type

Type of Housing	Shoreline (units)	Shoreline (percent)	King County (units)	King County (percent)
Single-family	16,295	72.5%	504,083	59.3%
Duplex	258	1.1%	16,727	2.0%
Triplex/4-plex	516	2.3%	37,876	4.5%
Multifamily (5+ units)	5,218	23.2%	269,949	31.9%
Mobile Homes	134	0.6%	17,385	2.1%
Other (boat, RV, van, etc.)	49	.02%	753	0.1%

Source: American Community Survey 2008-2010

Table 3.2-2 Average Household Size

	1980	1990	2000	2010
Shoreline	2.7	2.5	2.5	2.4
King County	2.5	2.4	2.4	2.4

Source: 1980 Census, 1990 Census, 2000 Census, 2010 Census

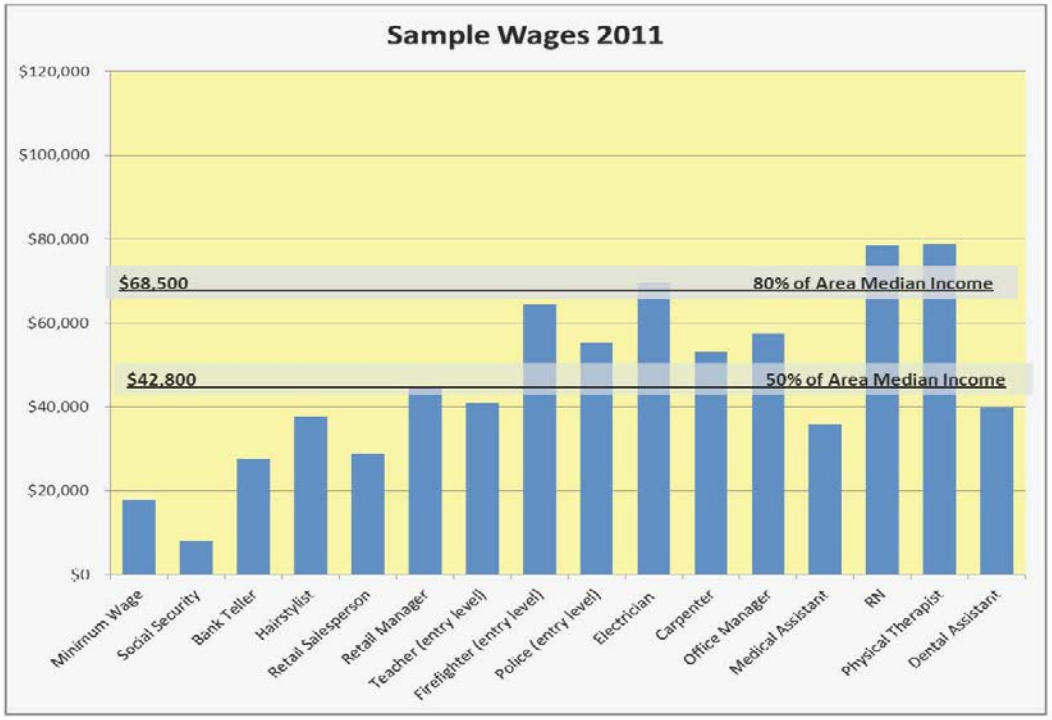


Figure 3.2-2 King County Median Income Levels/Wages of Various Professions

Table 3.2-3 Assisted Household Inventory

Provider	Units
King County Authority	669
HUD Subsidized Units	80
Tax Credit Properties **	272
Total	1,021

Source: City of Shoreline Office of Human Services, 2012

***The Low Income Housing Tax Credit program was created by Congress through passage of the Emergency Low-Income Housing Preservation Act in 1987. When the tax credits expire, these properties may be converted to market rate housing.*

Special Needs Housing and Homelessness

Group Quarters

Group quarters, such as nursing homes, correctional institutions, or living quarters for people who are disabled, homeless, or in recovery from addictions are not included in the count of housing units reported above. According to the 2010 Census, about 2.6 percent of Shoreline's population, or 1,415 people, live in group quarters. This is a slightly higher percentage than the 1.9 percent of King County residents living in group quarters. Fircrest in Shoreline, one of five state residential habilitation centers for people with developmental disabilities, provides medical care and supportive services for residents and their families. In 2011, Fircrest had about 200 residents. This reflects a decline from more than 1,000 residents 20 years ago, as many residents moved into smaller types of supported housing, such as adult family or group homes.

Financially Assisted Housing

As shown in **Table 3.2-3** financially assisted housing units for low- and moderate-income individuals and families exist in the City of Shoreline.

In addition to this permanent housing, King County Housing Authority provided 566 vouchers to Shoreline residents through the Section 8 federal housing program, which provides housing assistance to low income renters (City of Shoreline Office of Human Services, 2012).

Homelessness

According to the Shoreline School District, 123 students experienced homelessness during the 2010-2011 school year. According to the 2012 King County One Night Count of homeless individuals, 31 people were found living on the streets in the north end of King County.

Emergency and Transitional Housing Inventory

Five emergency and transitional housing facilities provide temporary shelter for their current maximum capacity of 49 people in the City of Shoreline. These facilities focus on providing emergency and transitional housing for single men, families, female-headed households, veterans, and victims of domestic violence. These facilities are listed in **Table 3.2-4**.

Housing Tenure and Vacancy

Historically, Shoreline has been a community dominated by single-family, owner-occupied housing. More recently, homeownership rates have been declining. Up to 1980, nearly 80 percent of housing units located within the original incorporation boundaries were owner-occupied.

In the 1980s and 1990s a shift began in the ownership rate. The actual number of owner-occupied units remained relatively constant, while the number of renter-occupied units increased to 32 percent of the city's occupied housing units in 2000, and nearly 35 percent in 2010. This shift was mainly due to an increase in the number of multi-family rental units in the community. Refer to **Table 3.2-5**.

A substantial increase in vacancies from 2000 to 2010 may partially be explained by apartment complexes, such as Echo Lake, that had been built but not yet occupied during the census count, or by household upheaval caused by the mortgage crisis. More recent data indicates that vacancies are declining (see discussion later in this section).

Housing Demand and Affordability

Housing demand is largely driven by economic conditions and demographics. Economic and market conditions have been assessed for the station subarea, and these are summarized in Section 3.1. Demographic characteristics influence market demand with regard to number of households; household size, make-up, and tenure (owner vs. renter); and preference for styles and amenities. For instance, singles, empty nesters, seniors, and others may prefer smaller units with goods, services, and transit within walking distance as opposed to a home on a large lot that would require additional maintenance and car ownership. It is important for Shoreline to have a variety of housing styles to accommodate the needs of a diverse population.

In 2010, about 61 percent of households were family households (defined as two or more related people), down from 65 percent in 2000. Approximately 30 percent were individuals living alone, an increase from 26 percent in 2000. The remaining 9 percent were in nonfamily households where unrelated individuals share living quarters. Households with children decreased from 33 percent of households in 2000 to 28 percent of households in 2010. Single-parent families also decreased from 7.4 percent to 6.9 percent of households, reversing the previous trend of increasing single-parent families. Shoreline now has a lower percentage of households with children than King County as a whole, where households with children account for about 29 percent of all households, down from 30 percent in 2000. **Table 3.2-6** summarizes the changing characteristics of households.

A Changing Community

In addition to the changes noted above, Shoreline's population is becoming more ethnically and racially diverse. In 2000, 75 percent of the population was white (not Hispanic or Latino). By 2010, this percentage dropped to 68 percent.

Shoreline's changing demographic characteristics may impact future housing demand. Newer residents may have different cultural expectations, such as extended families living together in shared housing. The increase in the number of singles and older adults in the community suggests that there is a need for homes with a variety of price points designed for smaller households, including accessory dwelling units or manufactured housing.

Demographic changes may also increase demand for multi-family housing. Such housing could be provided in single-use buildings (townhouses, apartments, and condominiums), or in mixed-use buildings. The need for housing in neighborhood centers, including for low and moderate income households is expected to increase. Mixed-use developments in central areas close to public transit will allow for easier access to neighborhood amenities and services, and could make residents less dependent on autos.

The Need for Affordable Housing

The GMA requires CPPs to address the distribution of affordable housing, including housing for all income groups. The CPPs establish low and moderate income household targets for each jurisdiction within the county to provide a regional approach to housing issues, and to ensure that affordable housing opportunities are provided for lower and moderate income groups. These affordable housing targets are established based on a percent of the City's growth target.

Table 3.2-4 Emergency and Transitional Housing Inventory

	# Occupants	Focus
Caesar Chavez	6	Single Men
Wellspring Project Permanency	14	Families
Home Step Church Council of Greater Seattle	4	Female Head-of-Household
Shoreline Veterans Center	25	Veterans
Confidential Domestic Violence Shelter	6	Victims of Domestic Violence

Source: City of Shoreline Office of Human Services, 2012.

Table 3.2-5 Housing Inventory and Tenure

	2000	2010	Change 2000-2010
Total Housing Units	21,338	22,787	+1,449
Occupied Housing Units	20,716	21,561	+845
Owner-Occupied Units	14,097 68.0% of occupied	14,072 65.3% of occupied	-25 0.2% decrease
Renter-Occupied Units	6,619 32.0% occupied	7,489 34.7% of occupied	+870 13.1% increase
Vacant Units	622 2.9% of total	1,226 5.4% of total	+612 99.7% increase

Source: 2000 Census; 2010 Census

Table 3.2-6 Changing Household Characteristics in Shoreline

	2000	2010	Change 2000-2010
Total Households	20,716	21,561	+845
Households with Children	6,775 32.7% of total	6,015 27.9% of total	-760 11.2% decrease
Single-person Households	5,459 26.5% of total	6,410 29.7% of total	+951 17.4% increase
Households with an Individual over 65	4,937 23.8% of total	5,509 25.6% of total	+572 11.6% increase

Source: 2000 Census; 2010 Census

Table 3.2-7 Households by Income Level in Shoreline and King County

	Shoreline	King County
Very Low Income (<30% AMI)	3,154 (15%)	53,784 (13%)
Low Income (30%-50% AMI)	2,580 (12%)	52,112 (11%)
Moderate Income (50%-80%AMI)	3665 (17%)	76,279 (16%)
80%-120% AMI	4,443 (21%)	97,116 (19%)
>120% AMI	7,520 (35%)	216,821 (41%)

Source: 2008-2010 American Community Survey; King County Comprehensive Plan

The CPPs more specifically state affordability targets for moderate income households (earning between 50 percent and 80 percent AMI) and low-income households (earning below 50 percent AMI). The moderate-income target is 16 percent of the total household growth target, or 800 units. The low income target is 22.5 percent of the growth target, or 1,125 units. Of the current housing stock in Shoreline, 37 percent is affordable to moderate-income households and 14 percent is affordable to low income households (King County Comprehensive Plan, Technical Appendix B).

Assessing affordable housing needs requires an understanding of the economic conditions of Shoreline households and the current stock of affordable housing. Estimated percentage of households at each income level is presented in **Table 3.2-7**.

Affordability Gap

The "affordability gap" is the difference between the percentage of city residents at a particular income level and the percentage of the city's housing stock that is affordable to households at that income level. A larger gap indicates a greater housing need. **Table 3.2-8** depicts the affordability gap.

Where affordability gaps exist, households must take on a cost burden in order to pay for housing. Cost-burdened households paying more than 30 percent of household income for housing costs comprise 39 percent of homeowners and 48 percent of renters in Shoreline. Very low income cost-burdened households are at greatest risk of homelessness and may be unable to afford other basic necessities, such as food and clothing. The substantial affordability gap at this income level suggests that the housing needs of many of Shoreline's most vulnerable citizens are not being met by the current housing stock. Closing this gap will require the use of innovative strategies to provide additional new affordable units and the preservation/ rehabilitation of existing affordable housing.

In order to assess the relative status of housing affordability in the city, comparison cities in King County were selected based on number of households and housing tenure. Two cities (Sammamish and Mercer Island) with few renters were selected for comparison, along with two cities (Kirkland and Renton) with a higher proportion of renting households. To compare Shoreline to these cities and to King County, the number of households in each income group countywide was compared to the number of housing units affordable at each income level. **Table 3.2-9** shows the comparison of affordability gaps in these communities to Shoreline's.

Figure 3.2-3 shows Affordable Housing Units by Income Group in a map that shows multiple factors related to housing affordability in various Shoreline neighborhoods, and this complexity warrants a description that is not included with other maps. The map shows average household income levels of various neighborhoods, by census tract. For each neighborhood, there is also a list that begins with the name of the neighborhood, and displays the number of houses whose assessed value would be considered affordable to various income groups. Recall that to be affordable, a mortgage and expenses, such as property tax, should not exceed 30 percent of the annual household income. The price range for housing that would be affordable for each income group is listed in the legend.

To provide an example, in the Meridian Park Neighborhood, one of the neighborhoods of the station subarea, the average household income in 2010 was $82,148. Within that neighborhood, there were 3 homes appraised below $99,720,

which is the price a very low income household would be able to afford without exceeding 30 percent of their income. There are 735 homes appraised between $99,720 and $265,999, which is the price a low income household would be able to afford without exceeding 30 percent of their income.

Falling Home Values

As in much of the rest of the country, home prices in Shoreline fell during the Great Recession years, but have recently started to rise again. After increasing rapidly for over a decade, median sales price reached a peak in June 2007 at $375,300. The median sales price in December 2011 was $262,600, a decrease of 30 percent. (See **Figures 3.2-4 and 3.2-5**).

While decreasing prices lower the affordability gap for prospective buyers, they can also increase risk of deferred maintenance, vacancy, and abandonment. Although home and property prices are now increasing again, they have yet to reach peak levels of 2007.

A Segmented Market

While home prices have decreased citywide since 2007 and recently have started to rise again, there is a large discrepancy in the value of homes in the city's various neighborhoods. **Table 3.2-10** presents data extracted from home sales records used by the King County Assessor to assess the value of homes in various sub-markets within the city (the Assessor excludes sales that are not indicative of fair market value). Citywide data suggests that home values have continued to decline since 2010, though regional trends suggest the rate of decline is now slowing.

Rising Rents

In contrast to the single-family market, apartment rents in Shoreline have stabilized near highs reached in 2009, and are likely to continue trending upward as vacancies decline. According to the most recent data available, the average rent increased from $859 in September 2007 to $966 in March 2012. Year-over-year trends in the Shoreline area rental market (which includes the cities of Shoreline and Lake Forest Park) are included in **Table 3.2-11** for 2008-2012. The increasing price of rental options may be limiting the city's attractiveness to new families, and the ability to provide affordable housing options for younger or fixed-income citizens and smaller households.

Neighborhood Quality and Housing Choice

Neighborhood quality and the availability of diverse housing choices to fit various income levels have a direct relationship to greater housing demand. The Citizen Advisory Committee of the Comprehensive Housing Strategy stressed the need to define and retain important elements of neighborhood character, while also providing housing choice. Some members of the community have expressed concern about density and design of infill developments and the impacts of these developments on existing neighborhoods. Some members of the community support additional density and infill development, either to preserve undeveloped land in rural areas, support transit, encourage business and economic development, increase affordability, and for other reasons. Regulations that implement policy recommendations in the Housing Element and Strategy should strive to balance these concerns and opportunities.

Housing choice refers to the ability of households in the city to live in the neighborhood and housing type of their own choosing. Housing choice is supported by providing a variety of housing that allows older adults to age in place and new families to be welcomed into existing neighborhoods.

Table 3.2-8 Affordability Gap

	Percent of Units Affordable to Income Group	Affordability Gap
Very Low Income (<30% AMI)	825 (3.9%)	11%
Low Income (30%-50% AMI)	2,116 (10%)	2%
Moderate Income (50%-80% AMI)	4,886 (23%)	N/A
80%-120% AMI	6,367 (30%)	N/A

Source: King County Comprehensive Plan

** Vacant units are not included in the analysis, since the affordability of vacant units is unknown.*

Table 3.2-9 Comparison of Affordability Gap

	Very Low Income Affordability	Low Income Affordability Gap	Moderate Income Affordability Gap	80%-120% AMI Affordability Gap
Sammamish	12.1%	9.6%	10.1%	2.1%
Mercer Island	10.1%	8.9%	6.0%	6.7%
Shoreline	**8.6%**	**1.2%**	**N/A**	**N/A**
Kirkland	9.9%	4.9%	N/A	N/A
Renton	8.8%	N/A	N/A	N/A
King County	8.4%	N/A	N/A	N/A

Source: King County Comprehensive Plan

** Discrepancy with Table H-8 results from use of Countywide household data for comparison with other cities and King County*

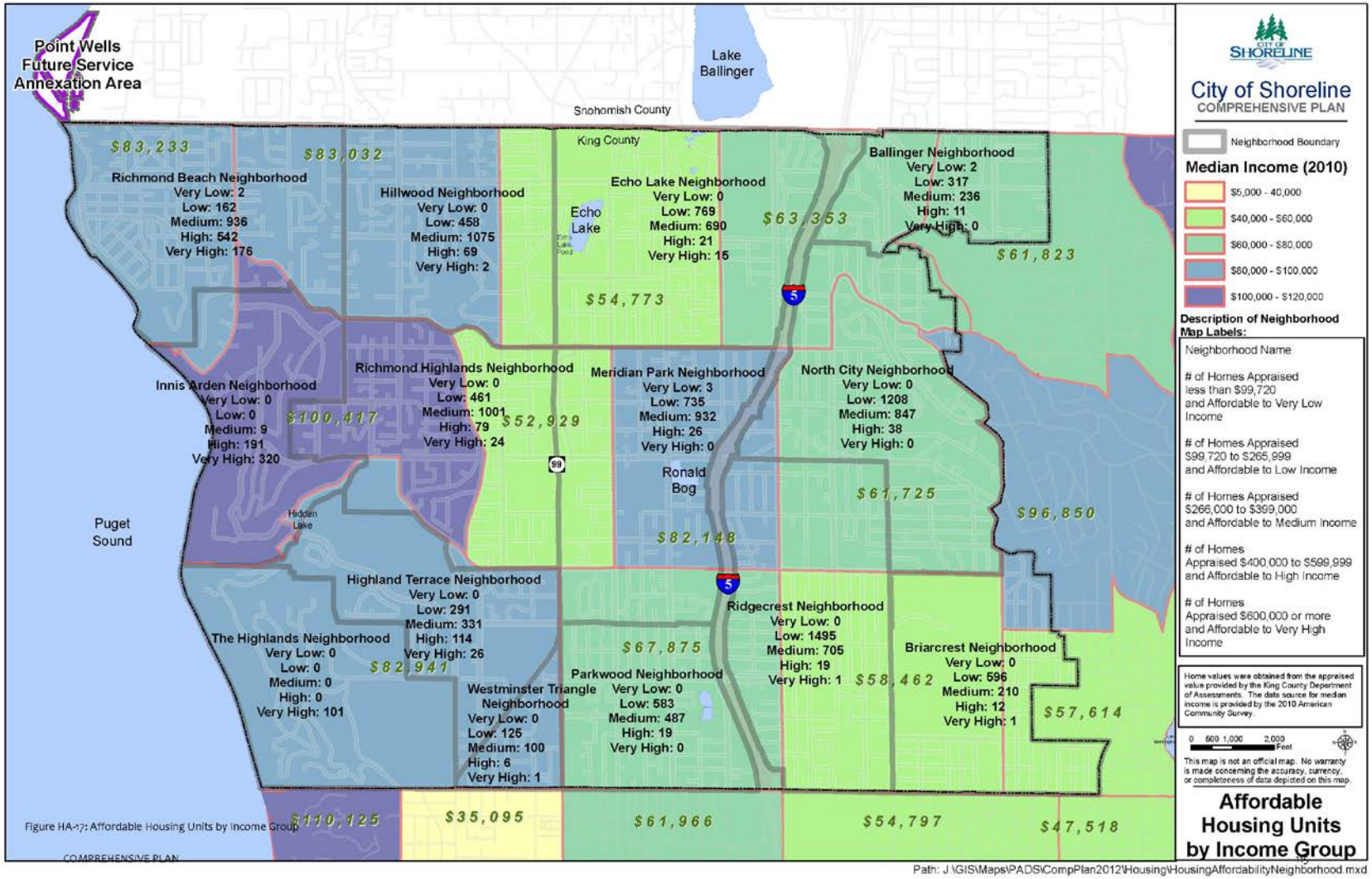


Figure 3.2-3 Affordable Housing Units by Income Group in Shoreline

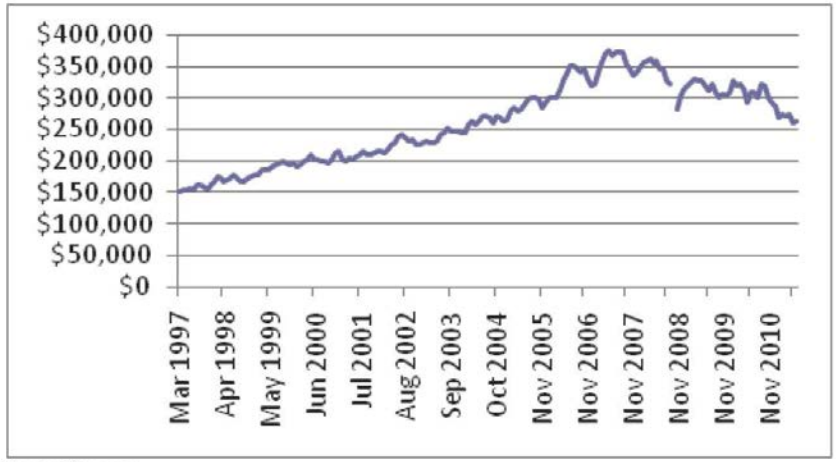


Figure 3.2-4 Median Sales Price of Homes in Shoreline

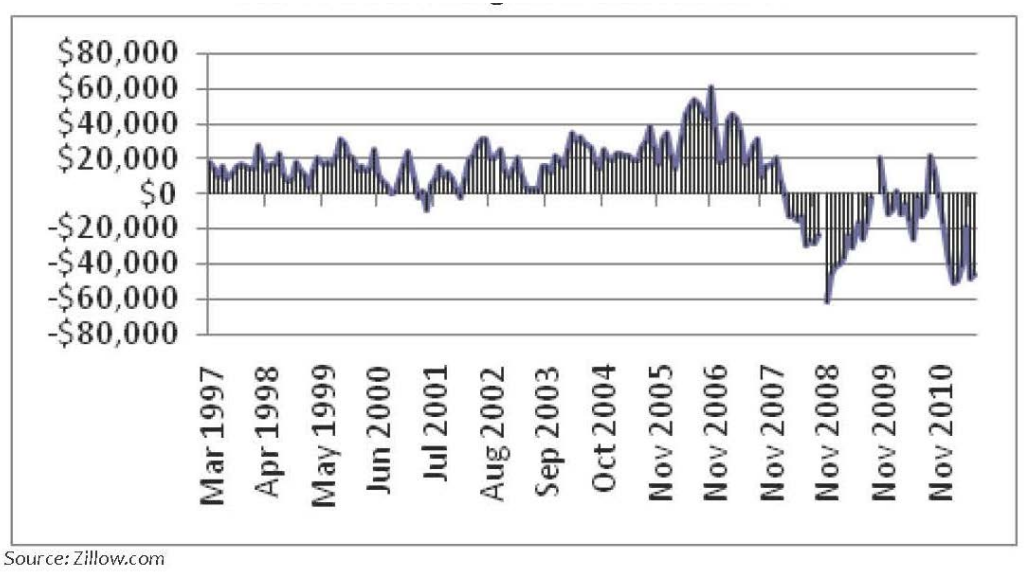


Figure 3.2-5 Year-Over-Year Change in Median Sales Price

Table 3.2-10 Single Family Housing Prices

Neighborhood Area	Median Sale Price, 2010	Affordable Income Level*	Average Change in Assessed Value, 2010-2011
West Shoreline	$500,00	>120% of AMI	-2.8%
West Central	$341,500	115% of AMI	-6.0%
East Central	$305,000	100% of AMI	-6.9%
East Shoreline	$290,000	100% of AMI	-5.2%

Sources: King County Assessor 2011 Area Reports, 2011 HUD Income Levels

**Figures given are the percent of 2011 typical family Area Median Income required to purchase a home at the 2010 median price. Affordable Housing Costs are based on 30% of monthly income. Figures are approximate. Additional assumptions were made in the affordability calculation.*

Table 3.2-11 Shoreline Area Rental Market Rents & Vacancy Rates

	2008	2009	2010	2011	2012
Average Rent	$897	$977	$949	$934	$966
Market Vacancy*	2.7%	4.6%	7.1%	5.0%	4.0%

Source: Dupre+Scott, The Apartment Vacancy Report

**Market Vacancy excludes units in lease-up and those undergoing renovation*

While Shoreline's single-family housing is in generally good condition and highly desirable for many, new housing close to neighborhood centers and high-capacity transit may be equally desirable to older adults, small households, or special-needs households with financial or mobility limitations.

Other benefits of locating housing in neighborhood centers and in close proximity to high-capacity transit include:

- Transportation cost savings;
- Improved fitness and health through increased walking;
- Lower costs for roads, utilities, and emergency services;
- Reduced road and parking costs;
- Reduced regional congestion;
- Energy conservation;
- Reduced emissions; and
- Preservation of open space.

GMA and Regional Policies Supporting Affordable Housing

The City of Shoreline's policies related to housing and relevant to potential development in the station subarea are summarized in Section 3.1. It is also important to consider state and regional policies as guidance for subarea planning. The GMA specifically states that its housing goal is to:

"Encourage the availability of affordable housing to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock."

King County CPPs also encourage affordable housing and the use of innovative techniques to meet the housing needs of all economic segments of the population, and require that the City provide opportunities for a range of housing types.

The City's Comprehensive Housing Strategy, adopted in 2008, recommended increasing affordability and choice within local housing stock in order to accommodate the needs of a diverse population. Demographic shifts, such as aging "Baby Boomers" and increasing numbers of single-parent or childless households create a market demand for housing styles other than a single-family home on a large lot.

Puget Sound Regional Council (PSRC) administers the Growing Transit Communities Partnership (GTC). In accordance with the goals of the PSRC and GTC, high-capacity station areas should consider adopting the affordable housing policies and provisions stated in PSRC's VISION 2040. A few are included below, for the full list, read their report, available at: http://www.psrc.org/growth/growing-transit-communities/growing-communities-strategy/read-the-full-growing-transit-communities-strategy/

MPP-H-1 *Provide a range of housing types and choices to meet the housing needs of all income levels and demographic groups within the region.*

MPP-H-2 *Achieve and sustain — through preservation, rehabilitation, and new development — a sufficient supply of housing to meet the needs of low income, moderate-income, middle-income, and special needs individuals and households that is equitably and rationally distributed throughout the region.*

MPP-H-3 *Promote homeownership opportunities for low-income, moderate income, and middle-income families and individuals.*

City of Shoreline Affordable Housing Policies and Requirements—Chapter 20.40.230 of the Development Code includes specific provisions for affordable housing . These provisions will be updated for specific application in the light rail station subareas. In addition, the City has developed specific draft policies for the subarea that address affordable housing needs. These policies and draft Development Code provisions are provided in Section 3.2.3 Mitigation Measures. Other Code provisions and development standards related to housing and mixed use development in the subarea are summarized in Section 3.1 of this FEIS.

Employment in Shoreline and the Subarea

In 2012, approximately 16,409 jobs existed in the City of Shoreline. Of these jobs, approximately 46 percent were service related; 17 percent were government; 16 percent were retail; 13 percent were education; 3 percent were construction; 3 percent were finance, insurance, and real estate; 1 percent was wholesale trade, transportation, and utilities; and 1 percent was manufacturing (PSRC Employment Database).

Most of these jobs were located along Aurora Avenue N. However, other employment clusters include the Shoreline Community College, and neighborhood business centers in North City, Richmond Beach Shopping Center, 5th Avenue NE and NE 165th Street, and 15th Avenue NE and NE 145th Street. Less obvious places of employment include home occupations (people working out of their homes).

Major employers within the community include (listed in alphabetical order):

- CRISTA Ministries
- Costco
- Fircrest Residential Habilitation Center
- Fred Meyer
- Goldie's Casino
- Home Depot
- Northwest Security
- Shoreline, City of
- Shoreline School District
- Shoreline Community College
- State Department of Transportation

In the 185th Street Station Subarea and nearby areas within the TAZ boundaries, there are currently 1,448 jobs, including jobs along Aurora Avenue N/Town Center Subarea and in the North City Subarea, which are anchors to the station subarea. This is an estimated level of employment, which was also assumed in the City's Transportation Master Plan.

Employment Growth Trends and Targets

Employment within the city is a measure of the current economic activity. The following employment growth characteristics were summarized in the Economic Development Supporting Analysis to the City's 2012 Comprehensive Plan.

- Non-government employment in Shoreline is predominantly oriented toward services and retail. These two sectors comprised 62 percent of total employment as of 2010.

- Employment growth has been concentrated in services, which was the fastest growing sector between 2000 and 2010.
- The other non-government sectors in which employment grew in the last decade were manufacturing and construction/resources. Despite growth, the two sectors together accounted for only 4.4 percent of the total employment as of 2010.
- Total employment in Shoreline continued to grow over the past decade, though at a much slower pace than in the previous five years.

Encouraging employment growth within the city would improve Shoreline's jobs-to-housing ratio/balance. Jobs and housing are "balanced" at approximately 1.5 jobs per household. Jobs-to-housing ratio or balance is "a means to address travel demand by improving accessibility to jobs, as well as to goods, services, and amenities" (PSRC, Vision 2040). The creation of new jobs through economic development can help alleviate a mismatch between jobs and housing, reducing commute times and creating more opportunities for residents to work and shop within their own community.

Shoreline's jobs-to-housing ratio was 0.72 in 2010 compared to the desirable ratio of 1.5, highlighting the need for job growth and employment-supporting development.

The City conducted an analysis that compared its employment characteristics to other cities in the region and found that jobs-housing balance varies considerably throughout the region. Ratios of comparative cities in 2010 were:

- Lynnwood 1.53
- Tukwila 5.56
- Marysville 0.51
- Kirkland 1.27

King County's overall ratio was 1.29 and Snohomish County's was 0.82.

In comparing Shoreline's median household income, unemployment rate, and poverty rate to these same peer cities, Shoreline had the second highest median income (only Kirkland was higher); the second lowest unemployment rate (Kirkland was lower); and the second lowest poverty rate (Kirkland was lower).

The King County Countywide Planning Policies, adopted to implement the GMA, establish employment growth targets for each of the jurisdictions within the county. The employment target is the amount of job growth the jurisdiction should plan to accommodate during the 2006-2031 planning period. Shoreline's growth target for this period is 5,000 additional jobs, projected to 5,800 by 2035. This employment growth target was also adopted by the City.

A more recent target set by PSRC calls for Shoreline to gain more than 7,200 new jobs by 2035, improving its jobs-to-housing ratio to 0.91.

Several factors constrain substantial commercial development (and resultant job growth) in Shoreline, including the limited number of large tracts of developable land available for commercial or industrial uses.

In the past, Shoreline was considered a "bedroom community" from which residents travelled elsewhere for higher-wage jobs and more complete shopping opportunities. Recognizing new and innovative ways to support the local economy will assist efforts to

plan for the addition of new jobs. The quality of Shoreline's economy is affected by reliable public services, the area's natural and built attractiveness, good schools, strong neighborhoods, efficient transportation options, and healthy businesses that provide goods and services. Maintaining the community's quality of life requires a strong and sustainable economic climate.

Other Economic Conditions Pertinent to Growth and Economic Development Opportunities

Revenue Base—Sales Tax and Property Tax

The revenue base of the City is another measure of the strength of the local economy. A strong revenue base supports necessary public facilities and services for an attractive place to live and work. Two major elements of the revenue base are taxable retail sales and the assessed valuation for property taxes. A review of Shoreline's taxable sales and assessed valuation compared with other cities yielded the following observations.

- Compared to the peer cities and King County, Shoreline has a relatively low revenue base. Among peer cities, Shoreline had the second lowest per capita taxable sales and second lowest per capita assessed valuation in 2010.
- Growth in assessed valuation has been moderate over the past decade, averaging a 6.7 percent annual increase. This could be due to a relative lack of new construction in comparison to a younger community, such as Marysville.
- Retail sales growth has averaged 1.5 percent annually. This is the second highest rate of increase among the peer cities and higher than King County as a whole.

Other Revenue Sources

Other sources of revenue for the City include the gambling tax, utility tax, permit fees, and other fees. Gambling taxes are collected at a rate of 10 percent of gross receipts for card rooms in the city. Projected gambling tax revenue for 2012 equals 6 percent of the total forecasted general fund operating revenues. Thirteen percent of total forecasted general operating revenues are expected to come from the utility tax, and 8 percent from license and permit fees. This compares to 32 percent from property taxes, and 20 percent from sales taxes. The remaining revenue comes from contract payments, state and federal grants, and other sources.

Real Estate Market Conditions—Retail

Retail development meets two important economic development objectives. It provides the goods and services needed by residents and businesses, and it provides a major source of tax revenue.

Retail sales in Shoreline have grown over the past decade, yet they are still lower than sales in the peer cities used for comparison. While Shoreline is home to many retail establishments, there is a significant amount of sales "leakage" in some retail categories. Leakage refers to a deficit in sales made in the city compared with the amount of spending on retail goods by Shoreline residents. This leakage suggests that there are major retail opportunities in several areas, as shown below.

Percentage of Shoreline Resident Retail Dollars Spent Elsewhere (Leakage):

- Health and Personal Care Stores: 41.2 percent
- Clothing and Clothing Accessories Stores: 90.5 percent
- General Merchandise Stores: 71.2 percent
- Food Service and Drinking Places: 36.5 percent

Real Estate Market Conditions—Office

Shoreline has few large office concentrations or multi-tenant office buildings. New office development could provide locations for various service providers, as well as the management and support facilities for businesses with multiple outlets. The office vacancy rate for buildings listed on Officespace.com is approximately 25 percent. However, there is little or no new Class A office space in the city available to prospective tenants.
The Shoreline Center site in the station subarea is of a size that could support major redevelopment of a mix of uses, including office, residential, retail, community, and recreational uses. The office community, and recreational uses on the site today could be housed in newer more compact facilities, opening a large portion of the site to redevelopment potential.

Real Estate Market Conditions—Residential

New residential development in Shoreline provides housing for the local workforce and creates new opportunities for families to live in the city. Permit activity for new residential development has been increasing since 2010. The Countywide Planning Policies (CPPs) for King County set a target for the City of Shoreline to grow by about 200 households per year. A faster pace of new residential development will be needed in Shoreline to achieve this goal, and to achieve the overall target of 5,800 additional households by 2035 (with the starting year of 2006). Market analysis completed for the subarea show a demand for residential use (see Section 3.1 for more information).

2012-2017 Economic Development Strategic Plan

The City of Shoreline's Office of Economic Development Strategic Plan for 2012-2017 is summarized in Chapter 2 of this FIES. The plan seeks to achieve sustainable economic growth by supporting place making projects.

3.2.2 Analysis of Potential Impacts

Population, Housing, and Employment Forecasts for Each Alternative

Under all alternatives, the number of households and jobs would increase. Alternative 4—Preferred Alternative would result in the most housing opportunities and highest level of households of the action alternatives at full build-out. Alternative 3—Previous Most Growth would result in less housing than Alternative 3, but more than Alternative 2—Some Growth. Alternative 3—Previous Most Growth would result in the highest number of jobs based on the intensity of employment use assumed with redevelopment of the Shoreline Center site.

All three of the action alternatives would assist the City in meeting household and employment growth targets, consistent with the Countywide Planning Policies. However, Alternative 4—Preferred Alternative would provide the most capacity and flexibility to achieve the targets over time. Implementing Phase 1 zoning would not affect the ability to meet the growth targets since the same pace of average annual growth (1.5 percent to 2.5 percent) would be the same. Alternative 1 would have very limited ability to assist the City in meeting its growth targets.

Current population, households, and employment levels in the subarea are shown in **Table 3.2-12**. Forecasted growth in population, housing, and employment for each of the alternatives is summarized in more detail below and depicted in **Table 3.2-13**. The net change in population, households, and employment from current levels is shown in **Table 3.2-14**.

Alternative 4—Preferred Alternative

Under Alternative 4, the population would increase to 56,529 at full build-out with approximately 23,554 households and 15,340 jobs. Full build-out assumes that all rezoned areas in the full Alternative 4 proposal would be built out to at least their baseline allowable zoning, including a portion of the Town Center Subarea, all of the North City Subarea, and the Shoreline Center. This would take many decades.

The net increase of population, households, and jobs in the subarea over current levels would be would be 48,585 additional people, 20,244 additional households, and 13,892 additional jobs.

For Alternative 4, it is anticipated that full build-out would take approximately 80 to 125 years (2095 to 2140) to be realized at an estimated annual rate of growth between 1.5 percent and 2.5 percent.

It is important to consider that growth may not happen at a steady, even pace year-to-year. As larger redevelopment projects are implemented, there may be higher growth rates in those years. For example if the Shoreline Center site were to redevelop at some point in the future, the addition of households and employment opportunities there would cause a spike in growth in the subarea during the year of full occupation.

The addition of jobs in the subarea would help to achieve a balanced jobs-to-housing ratio in Shoreline over time and in meeting the region's projections for employment growth in Shoreline (5,800 to 7,200 jobs by 2035). Given the build-out time frame of 80 to 125 years, only a portion of the 27,050 total jobs would be in place by 2035 to meet the target range. As mentioned previously, the city has the capacity elsewhere to meet the job growth target range.

The Next Twenty Years for Any Action Alternative

By 2035, any of the action alternatives would be anticipated to grow at the same pace (applying the estimated annual growth rate of around 1.5 percent to 2.5 percent).

Because of the higher densities allowed and the higher capacity for change, Alternative 4 could potentially build-out at a faster rate than Alternative 3 or 2, but the maximum growth rate would still be expected to be around the average annual 2.5 percent increase. If the Phase 1 zoning were adopted, build-out over the next twenty years and beyond would be contained within the proposed Phase 1 zoning area (see below).

Over the next twenty years, it is anticipated that the population of the subarea would grow to between 10,860 and 13,343 people—2,916 to 5,399 above today's current population in the subarea (including population within the TAZ boundaries that encompass the subarea).

A total of 4,450 to 5,500 households would be expected by 2035, as well as approximately 1,950 to 2,370 jobs. This would be an increase in households of approximately 1,140 to 2,190 and an increase in jobs of approximately 502 to 928 over today's levels.

Potential Phase 1 Zoning Build-Out Capacity

The Phase 1 zoning area provides more than enough capacity to accommodate the next twenty years of growth while also allowing some flexibility to respond to market forces and property owners' interests. While the City would plan to evaluate the status of the subarea in twenty years and potentially unlock the rest of the zoning under Alternative 4—Preferred Alternative at that time (if phased zoning is adopted), the Phase 1 zoning

area is large enough to accommodate additional growth beyond twenty years.

Alternative 3—Previous Most Growth

Identified as the "Most Growth" alternative in the Draft Environmental Impact Statement, Alternative 2 is now called "Previous Most Growth" because Alternative 4—Preferred Alternative proposes more growth overall than Alternative 3.

Under Alternative 3, the population would increase to 37,315, and approximately 15,548 households and 27,050 jobs could be accommodated in the station subarea at full-build out of proposed zoning, including a portion of the Town Center Subarea, all of the North City Subarea, and the Shoreline Center.

Alternative 3 would result in more jobs than under Alternative 4 due to the assumption that the Shoreline Center would fully redevelop to the maximum allowed density under a Development Agreement and provide more commercial and employment uses than under the other alternatives. Alternative 4 assumes that more housing would be developed throughout the subarea and that density/height bonuses would be applied to 25 percent of the all areas zoned MUR-85' in subarea at build-out.

It is anticipated that full build-out would take approximately 60 to 100 years (2075 to 2115). This alternative would add potentially 29,371 people, 12,238 households and 25,602 jobs in the subarea above current levels.

Alternative 2—Some Growth

Under Alternative 2, the population would increase to 17,510 total at full build-out of the proposed zoning, including a portion of the Town Center Subarea and all of the North City Subarea. Approximately 7,296 households and 9,750 jobs could be accommodated within the station subarea. This also assumes that the Shoreline Center site would be completely redeveloped to the zoned capacity.

This alternative would add potentially 9,566 people, 3,986 households, and 8,302 jobs to the subarea above the current levels. It is anticipated that full build-out of Alternative 2—Some Growth would take approximately 30 to 50 years (2045 to 2065) to be realized.

Alternative 1—No Action

Under Alternative 1, based on recent population and employment growth forecasts studied in the development of the City's Transportation Master Plan (dispersed option for growth), population in the subarea would grow to approximately 8,734 people. Current population in the subarea is estimated at 7,944 people, so under Alternative 1—No Action, it is estimated that there would be an additional 790 people by 2035.

Assuming an average of 2.4 people per household, there would be 3,639 households and 1,736 jobs within the station subarea by 2035. This compares to a current levels of 3,310 households and 1,448 jobs in the station subarea. As such, under Alternative 1—No Action, an additional 329 households and 288 jobs would occur in the subarea by 2035 approximately.

The anticipated growth in employment would not be effective in helping to address Shoreline's target range of between 5,800 and 7,200 jobs by 2035 and achieving a better jobs-to-housing balance. Most growth in employment would need to occur elsewhere in the city. A review of citywide zoning confirms that the city does have the capacity elsewhere to accommodate the employment target range.

Table 3.2-12 Current (2014) Population, Households, and Employment Estimates for the Subarea

Estimated Totals for Subarea Based on Available GIS Data, 2014	
Population	7,944
Households	3,310
Employees	1,448

Note: the current estimated total population of the City of Shoreline is 54,790.

Table 3.2-13 Estimated Twenty-Year and Build-Out Population, Households, and Employment Projections

	Alternative 4—Preferred Alternative	Phase 1 Zoning Area of Alternative 4	Alternative 3—Previous Most Growth	Alternative 2—Some Growth	Alternative 1—No Action
2035 Population*	10,860 to 13,343	10,860 to 13,343	10,860 to 13,343	10,860 to 13,343	8,734
2035 Households*	4,450 to 5,500	4,450 to 5,500	4,450 to 5,500	4,450 to 5,500	3,639
2035 Employees*	1,950 to 2,370	1,950 to 2,370	1,950 to 2,370	1,950 to 2,370	1,736
Build-Out Population	56,529	41,719	37,315	17,510	**
Build-Out Households	23,554	17,383	15,548	7,296	**
Build-Out Employees	15,340	10,227	27,050	9,750	**
Build-Out Years	80 to 125 years by 2095 to 2140		60 to 100 years by 2075 to 2115	30 to 50 years by 2045 to 2065	**

* Projections assume 1.5 percent to 2.5 percent annual growth rate for the action alternatives from the time the rezoning is adopted.

** For Alternative 1—No Action, only projections through the twenty-year horizon of 2035 were analyzed. Build-Out was not analyzed because the timeframe is for this is unknown and difficult to approximate.

Table 3.2-14 Projected Net Increases in Population, Households, and Employment over Current (2014) Levels

	Alternative 4—Preferred Alternative	Phase 1 Zoning Area of Alternative 4	Alternative 3—Previous Most Growth	Alternative 2—Some Growth	Alternative 1—No Action
2035 Population	+2,916 to +5,399	+2,916 to +5,399	+2,916 to +5,399	+2,916 to +5,399	+790
2035 Households	+1,140 to +2,190	+1,140 to +2,190	+1,140 to +2,190	+1,140 to +2,190	+328
2035 Employees	+502 to +928	+502 to +928	+502 to +928	+502 to +928	+288
Build-Out Population	+48,585	+33,775	+29,371	+9,566	
Build-Out Households	+20,244	+14,073	+12,238	+3,986	
Build-Out Employees	+13,892	+8,779	+26,602	+8,302	

The increase in the number of households projected for the next twenty years would be 1,140 at 1.5 percent growth and 2,190 at 2.5 percent growth under all action alternatives. Although the market assessment projected a demand for 700 households through 2035, that was a conservative estimate assuming the subarea would absorb 15 percent of the forecasted housing growth of 4,657 units for all of Shoreline by 2035. If the subarea supported 25 percent of the city's forecasted housing growth, the projection would be 1,164 additional units. There is also the potential that housing growth could occur more rapidly than projected given Seattle population growth in recent years. Zoning that provides more capacity for growth than projected provides flexibility to respond to market characteristics and homeowner preferences in the subarea.

Consistency with Housing and Employment Policies and Housing Choice Opportunities

Consistency with plans and policies is addressed in Section 3.1 of this FEIS. It is worth emphasizing in this section, however, that Alternative 4—Preferred Alternative would provide the most long term housing choice opportunities, as well as the greatest potential for affordable housing. Over time, a wider variety of housing types (multifamily and single family) would be developed and there would be an increase in number households and housing choices in the subarea.

The range of housing types would be affordable to a wider diversity of income levels. With proposed density and building heights that support mixed use development with housing over several stories, there is a high likelihood that a variety of for sale and for rent housing accommodations would be offered.

The City intends to apply a variety of requirements and incentives to encourage affordable housing in the subarea. In addition the City will partner with other organizations to promote greater housing choice and affordability. One incentive includes transportation impact fee ordinance adopted by City Council in August 2014 that included an exemption for affordable housing. Other incentives would include reduced parking requirements for affordable housing and bonus height/density allowances (refer to 3.2.3 Mitigation Measures).

Economic Development Opportunities

The greatest opportunities for residentially-driven economic development (more residents in the area spending at local businesses, shops, restaurants, etc.) would occur under Alternative 4. The greatest opportunity for employment and jobs related economic development would occur under Alternative 3, which assumes that higher buildings would be developed at the Shoreline Center site, including office and commercial uses in greater amount than under the other action alternatives. However, the projected number of jobs under Alternative 4 is substantial and would help the City achieve its employment growth targets and improve its jobs-to-housing ratio. Increased population base and households would support funding for capital improvements and new development would provide jobs for residents of the neighborhood, Shoreline, and the region.

Under Alternative 1, economic development growth through increases in population and job opportunities would be minimal.

Property Values and Property Taxes

How implementation of light rail and rezoning might affect property values and property taxes in the subarea was a common question of existing homeowners during the subarea planning process.

The potential for a new transit station to increase land values for properties adjacent to it is a topic that has been researched extensively over the past two decades in conjunction with the construction of numerous light rail and heavy rail systems across the US, often in the context of determining a "value premium" that can be "captured" to contribute to system financing. While use of "value capture" for financing is not envisioned for the Lynnwood Link extension, the research that has been conducted on this topic provides information to address questions raised by Shoreline residents near the new station site as to what impact the station might have on their property values, and potentially their property taxes.

Value Premium Impacts

A substantial amount of research and analysis has been undertaken by policy experts to track and document the effects of fixed guideway transit systems (e.g., term includes heavy rail and light rail) on property values. This topic has commanded so much attention because many policymakers believe that fixed guideway transit systems create a value premium, i.e. an increase in property values or related economic factors as a result of the increased access and desirability of the land served by the fixed guideway transit. If increased value can be linked to the transit investments, a portion of this increase sometimes has the potential to be "captured" up front in the transit development process, and converted to a funding source for public improvements that support the transit system. Numerous

studies have used statistical models and other methods to examine whether premiums exist for real estate prices or lease rates near transit stops, particularly for commuter and light rail systems. A summary of various fixed guideway transit value premium studies was published in 2008 by the Center for Transit Oriented Development, a non-profit organization associated with Reconnecting America. Entitled *Capturing the Value of Transit,* the publication reviews the concepts associated with this topic, and summarizes the findings of more than 20 analyses of the effect of fixed guideway transit on different land uses around the US. Many of these studies, in turn, identified a range of value premiums associated with fixed guideway transit, and utilized a variety of techniques to come to this conclusion.

A 1995 study, by Dr. John Landis at the University of California, Berkeley, found that values for single family homes within 900 feet of light rail stations in Santa Clara County were 10.8 percent lower than comparable homes located further away, and no value premium could be identified for commercial properties within one-half mile of BART stations in the East Bay of the San Francisco Bay Area. Compared to other research though, the potential for decrease in values is rare and likely influenced by other factors.

One of the most thorough analyses conducted after 2000, when contemporary fixed guideway transit systems had established their resurgence as a modern, desirable form of transportation in urban America, was conducted by Dr. Robert Cervero at the University of California, Berkeley. This study, a survey of other studies covering only housing value premiums associated with fixed guideway transit, found that among the seven locations (Philadelphia, Boston, Portland, San Diego, Chicago, Dallas, and Santa Clara County), value premiums ranged from 6.4 to over 40 percent. The authors concluded that value premiums depended on a variety of factors, including traffic congestion, local real estate market conditions, and business cycles.

Transit in Europe can also provide insight to ways of measuring value capture. A study of 15 light rail systems in France, Germany, the United Kingdom, and North America measured housing prices, residential rent, office rent, and property values in each of the cities, concluding that there was a positive value premium in all but two cities. These two cities initially experienced negative value impacts from fixed guideway transit due to the noise associated with the light rail system. Technological improvements have since reduced noise levels and most modern light rail systems are fairly quiet.

One key aspect of the literature is the separation of fixed guideway transit's impacts on existing real estate versus its impacts on new development. In many situations, once a fixed guideway transit system is planned, local governments also increase zoning densities or implement policies that densify allowable development. This makes sense, because fixed guideway transit allows the movement of people without commensurate automobile traffic impacts. However, studies of value premiums often face the challenge of controlling the analysis for changes in zoning (to allow for denser development) and the effects of related development policies. Conversely, increases in allowable development through denser zoning, even in the absence of fixed guideway transit, will almost always result

in a higher land value, because a developer can build more units on the same site under the increase in allowed density.

Based on the analysis of value premiums, and considering the range of outcomes for previous projects, it would be reasonable to assume a potential value premium ranging from five percent up to 10 percent for properties located within one-half mile of the new transit station (one-half mile is considered the point at which resident interest in walking to a transit station substantially decreases). This value premium would represent a one-time increase in values that would be associated with a new transit station, and would also capture the benefit of changes in zoning and other City implementation actions to encourage TOD projects.

Property Tax Impacts

An increase in property values does not result in a proportional increase in property taxes (e.g., a five percent increase in property value leading to a five percent increase in property taxes) due to the overlapping effects of three state constitutional and statutory measures:

- One-Percent Constitutional Limit: the State Constitutions limits the regular combined property tax rate for all agencies to one percent, except for voter approved levies for schools or other agencies (such as the increase in the tax rate approved by Shoreline voters in 2010);
- Levy Increase Limit: Taxing districts, such as cities, are limited to a levy limit (limit on increase in property tax revenues) of no more than one percent of prior year property tax revenues, except for increases due to new construction, annexation, or voter approved increases; and
- Levy Amount Limit: There is a statutory limit on the maximum total levy for various types of taxing districts. The current maximum amount for cities is 0.59 percent of assessed value, excluding any voter-approved additional levies.

King County reassesses properties to fair market value on an annual basis. However, because of the One-Percent Constitutional Limit and Levy Amount and Levy Increase Limits, an increase in property values and assessed values does not automatically lead to an equivalent increase in property taxes.

For example, each taxing district must on an annual basis adjust its levy (property tax) rate so that the increase in property taxes, excluding new construction, annexations, or voter-approved increases, does not exceed one percent. Other adjustments to levy rates may need to be made to stay within the One-Percent Constitutional and Levy Amount limits.

As described previously, there may be a potential for a *one-time* increase of between five to ten percent in property values within one-half mile of the NE 185th Street Station. The one-time increase in property values will need to be evaluated against overall changes in Shoreline property values to determine how it would impact property taxes for homeowners around the new 185th Street Station. For example, if the new NE 185th Street Station leads to a five percent increase in value, but this occurs in a hot real estate market where property values are increasing at a faster rate on an annual basis, the increase in assessed values for properties around the station may be driven more by market conditions than the new transit station.

Only in a flat market could homeowners around the new station possibly experience a one-time increase in property tax rates that could approach the rate of increase in property values. It should be noted that an increase in property values represents a 100 percent increase in homeowner equity.

Because of the complexity of the overlapping limits, it is not possible to make a specific forecast for how much property taxes might increase around the station area. Instead, one would need to run a series of multiple scenarios with varying assumptions for market-based increases in property values, the increase in the value of properties around a new transit station, and evaluation of how the constitutional and statutory limit affect Shoreline to come up with a projection for a range of possible outcomes. For homeowners who might be severely affected by a property tax increase, King County operates several programs to assist homeowners who may face difficulty paying property taxes for any reason. This includes a property tax exemption for senior citizens and disabled persons, based on household income, that freezes valuation and can create some exemptions from regular property taxes.

Another program provides property tax deferrals for homeowners with limited income. The State also provides a property tax deferral program, administered by county assessors, that allows for full or partial deferral of property taxes. Another State program provides means-tested direct grant assistance for property tax payments to seniors and disabled persons who are widows or widowers of veterans, which for eligible households could help offset an increase in property taxes if it occurs.

3.2.3 Mitigation Measures

Affordable Housing

Alternative 4—Preferred Alternative, there would still be an ongoing need to require and encourage affordable housing in the subarea. The City has drafted specific policies and development provisions for the subarea plan related to affordable housing. These are provided on the following pages for reference.

Draft Subarea Plan Policies for Housing

- Develop the systems necessary to implement and administer the City's new affordable housing program.

- Investigate financing and property aggregation tools to facilitate creation of affordable housing.

  Note: This policy should not be construed to mean use of eminent domain. It provides guidance to examine potential tools recommended by partner organizations, which were more complex than those included in draft Development Code regulations for the subarea plan.

Draft Development Code Provisions Related to Housing

20.20.010 A definitions.

Affordable Housing
Housing reserved for occupancy to households whose annual income does not exceed a given percent of the King County median income, adjusted for household size, and have housing expenses no greater than thirty (30) percent of the same percentage of median income. For the purposes of Title 20, the percent of King County median income that is affordable is specified in SMC 20.40.235.

20.20.016 D definitions.

Dwelling, Live/Work
Live-work unit means a structure or portion of a structure: (1) that combines a commercial activity that is allowed in the zone with a residential living space for the owner of the commercial or manufacturing business, or the owner's employee, and that person's household; (2) where the resident owner or employee of the business is responsible for the commercial or manufacturing activity performed; and (3) where the commercial or manufacturing activity conducted takes place subject to a valid business license associated with the premises.

20.20.024 H definitions.

Housing Expenses, Ownership Housing
Includes mortgage and mortgage insurance, property taxes, property insurances and homeowner's dues.

Housing Expenses, Rental Housing
Includes rent and appropriate utility allowance.

Household Income
Includes all income that would be included as income for federal income tax purposes (e.g. wages, interest income, etc.) from all household members over the age of eighteen (18) that reside in the dwelling unit for more than three (3) months of the year.

20.30.355 Development Agreement (Type L).

C. Development Agreement Contents for Property Zoned MUR-85' in order to achieve increased development potential: Each Development Agreement approved by the City Council for property zoned MUR-85' shall contain the following:

1. 20 percent of the housing units constructed onsite shall be affordable to those earning less than 60 percent of the median income for King County adjusted for household size for a period of no less than 50 years. The number of affordable housing units may be decreased to 10 percent if the level of affordability is increased to 50% of the median income for King County adjusted for household size. A fee in lieu of constructing the units may be paid into the City's affordable housing program instead of

constructing affordable housing units onsite. The fee is specified in SMC Title 3.

20.40.235 Affordable housing, Light Rail Station Subareas.

A. The purpose of this index criterion is to implement the goals and policies adopted in the Comprehensive Plan to provide housing opportunities for all economic groups in the City's Light Rail Station Subareas. It is also the purpose of this criterion to:

1. Ensure a portion of the housing provided in the City is affordable housing;

2. Create an affordable housing program that may be used with other local housing incentives authorized by the City Council, such as a multifamily tax exemption program, and other public and private resources to promote affordable housing;

3. Use increased development capacity created by the Mixed Use Residential zones to develop voluntary and mandatory programs for affordable housing.

B. Affordable housing is permitted and voluntary in MUR-35' and MUR-45'. Affordable housing is required in MUR-85'. The following provisions shall apply to all affordable housing units required by, or allowed through, any provisions of the Shoreline Municipal Code:

1. The City provides various incentives and other public resources to promote affordable housing.

C. **Mixed Use Residential zone affordable housing requirements.** The following provisions shall apply to all affordable housing units required by, or created through, any incentive established in the Shoreline Municipal Code, unless otherwise specifically exempted or addressed by the applicable code section for specific affordable housing programs or by the provisions of an approved development agreement:

1. Duration: Affordable housing units shall remain affordable for a minimum of fifty (50) years from the date of initial owner occupancy for ownership affordable housing. At the discretion of the Director a shorter affordability time period, not to be less than thirty (30) years, may be approved for ownership affordable housing units in order to meet federal financial underwriting guidelines.

Specific regulations providing for affordable housing are described below:

Location	Use	Targeted Affordability Level and Incentives	Mandatory or Voluntary Program
Mixed Use Residential – 85’	Residential	15 percent of rental units are affordable to families making 70 percent or less of the median income for King County adjusted for household size; or 15 percent of all owned units are affordable to households earning 80 percent or less of the median income for King County adjusted for household size. **Incentives provided:** Eligible for Property Tax Exemption Program and entitlement of 85-foot height and no density limits. **Bonus incentive:** 10 percent of the rental units affordable to households earning 80 percent or less the median income for King County adjusted for household size; or 10 percent of individual for sale/ownership units affordable to households earning 90 percent the median income for King County adjusted for household size for the first 300 units in the MUR-85’ zone.	Mandatory*
Mixed Use Residential – 45’	Residential	15 percent of rental units are affordable to households earning 60 percent or less of the median income for King County adjusted for household size. 15 percent of all for sale/individual ownership units are affordable to households earning 80 percent or less of median income for King County adjusted for household size. **Incentive:** Eligible for: Property Tax Exemption Program, permit fee reduction.	Voluntary

Mixed Use Residential – 35’	Residential	10 percent of rental units are affordable to families making 60 percent or less of the median income for King County adjusted for household size; or 10 percent of all for sale/individual ownership units are affordable families making 80 percent or less of the median income for King County adjusted for household size. **Incentive:** Eligible for: Property Tax Exemption Program, permit fee reduction.	Voluntary
Mixed Use Residential – 85’ w/ Development Agreement	Residential	20 percent of housing units constructed for rent or sale/individual ownership on site that are affordable to households earning 60 percent or less of the median income for King County adjusted for household size; or 10 percent of housing units constructed for rent or sale/individual ownership on site that are affordable to households earning 50 percent of the King County adjusted for household size. **Incentive:** Height may be increased above 85 foot limit; eligible for Property Tax Exemption Program.	Mandatory*

* Payment in lieu of constructing mandatory units is available.
See SMC 20.40.235(E)(1)

2. Designation of Affordable Housing Units: The Director shall review and approve the location and unit mix of the affordable housing units, consistent with the following standards, prior to the issuance of any building permit:

    a. Location: The location of the affordable housing units shall be approved by the City, with the intent that they are generally mixed with all other dwelling units in the development.

    b. Tenure: The tenure of the affordable housing units (ownership or rental) shall be the same as the tenure for the rest of the housing units in the development.

    c. Size (Bedroom): The affordable housing units shall consist of a range of the number of bedrooms that are comparable to the units in the overall development.

d. Size (Square Footage): Affordable housing units shall be the same size as market housing units with the same number of bedrooms unless approved by the Director. The Director may approve smaller units when: (a) the size of the affordable housing is at least ninety (90) percent of the size of the market housing in the project with the same number of bedrooms; and (b) the affordable units are not less than five hundred (500) square feet for a studio unit, six hundred (600) square feet for a one (1) bedroom unit, eight hundred (800) square feet for a two (2) bedroom unit and one thousand (1,000) square feet for a three (3) bedroom unit.

3. Timing/Phasing: The affordable housing units shall be available for occupancy in a time frame comparable to the availability of the rest of the dwelling units in the development unless the requirements of this section are met through SMC 20.40.235(E), Alternative compliance. The affordable housing agreement provided for in SMC 20.40.235(D) shall include provisions describing the phasing of the construction of the affordable units relative to construction of the overall development. If the development is phased, the construction of the affordable units shall be interspersed with the construction of the overall development.

4. Development Standards:

   a. Off-Street Parking: Off-street parking shall be provided for the affordable housing units consistent with SMC 20.50.390 unless reduced by the Director in accordance with SMC 20.50.400.

   b. Recreation Space: The recreation/open space requirements for housing units affordable to families making 60% or less of Adjusted Median Income for King County shall be calculated at fifty (50) percent of the rate required for market housing.

5. Depending on the level of affordability provided, the affordable housing units may be eligible for transportation impact fee waivers as provided in SMC 12.40.070(G).

6. In the event of a fractional affordable housing unit, payment in lieu in accordance with SMC 20.40.235(E)(1) is allowed for the fractional unit.

D. **Affordable housing agreement**. An affordable housing agreement shall be recorded with the King County Recorder's Office prior to the issuance of a building permit for any development providing affordable housing pursuant to the requirements or incentives of the Shoreline Municipal Code.

1. The recorded agreement shall be a covenant running with the land and shall be binding on the assigns, heirs, and successors of the applicant.

2. The agreement shall be in a form approved by the Director and the City Attorney and shall address price restrictions, homebuyer or tenant qualifications, affordability duration, phasing of construction, monitoring of affordability and any other topics related to the provision of the affordable housing units.

3. The agreement may, at the sole discretion of the City, establish a monitoring fee for the affordable units. The fee shall cover the costs to the City to review and process documents to maintain compliance with income and affordability restrictions of the agreement.

4. The City may, at its sole discretion, agree to subordinate any affordable housing regulatory agreement for the purpose of enabling the owner to obtain financing for development of the property.

E. **Alternative compliance**. The City's priority is for residential and mixed use developments to provide the affordable housing on site. The Director, at his/her discretion, may approve a request for satisfying all or part of a project's on-site affordable housing with alternative compliance methods proposed by the applicant. Any request for alternative compliance shall be submitted at the time of application and must be approved prior to issuance of any building permit. Any alternative compliance must achieve a result equal to or better than providing affordable housing on site.

1. Payment in Lieu of constructing mandatory affordable units – Payments in lieu of constructing mandatory affordable housing units are subject to the following requirements:

   a. Payments in lieu of constructing for sale/individual ownership units shall be based on the difference between the price of a typical market rate unit, and the price an income constrained household as defined in SMC 20.40.235(B)(1) can pay for the same unit adjusted for household size. Payments in lieu of construction for rental units shall be based on the present net value of the difference between the market and affordable rents as defined in SMC 20.40.235(B)(1) for the same units adjusted for household size. The fee shall be updated in the fee ordinance as part of the City's budget process.

   b. The payment obligation shall be due prior to issuance of any certificate of occupancy for the project. Collected payments shall be deposited in the City's Housing Trust Fund account.

2. Any request for alternative compliance shall:

   a. Include a written application specifying:
      i. The location, type and amount of affordable housing; and
      ii. The schedule for construction and occupancy;

   b. If an off-site location is proposed, the application shall document that the proposed location:
      i. Is within a ¼ mile radius of the project triggering the affordable housing requirements or the proposed location is equal to or better than providing the housing on site or in the same neighborhood;
      ii. Is in close proximity to commercial uses, transit and/or employment opportunities;

c. Document that the off-site units will be the same type and tenure as if the units were provided on site; and

d. Include a written agreement, signed by the applicant, to record a covenant on the housing sending and housing receiving sites prior to the issuance of any construction permit for the housing sending site. The covenants shall describe the construction schedule for the off-site affordable housing and provide sufficient security from the applicant to compensate the City in the event the applicant fails to provide the affordable housing per the covenants and the Shoreline Municipal Code. The intent is for the affordable housing units to be provided before, or at the same time as, the on-site market housing. The applicant may request release of the covenant on the housing sending site once a certificate of occupancy has been issued for the affordable housing on the housing receiving site.

20.40.245 Apartments

Apartments are allowed in the MUR zones. Microapartments are not allowed in the MUR zones. Microapartments are defined as a structure that contains single room living spaces with a minimum floor area of 120 square feet and a maximum floor area of 350 square feet. These spaces contain a private bedroom and may have private bathrooms and kitchenettes (microwaves, sink, and small refrigerator). Full scale kitchens are not included in the single room living spaces. These single room living spaces share a common full scale kitchen (stove, oven, full sized or multiple refrigeration/freezers), and may share other common areas such as bathroom and shower/bath facilities, recreation areas, and/or eating spaces.

Refer to Title 20 Development Code of the Shoreline Municipal Code, and in particular 20.30 General Development standards for additional information pertaining to regulations for housing and mixed use development.

Other Recommended Mitigation Measures

- The City would continue to monitor and support economic development opportunities in the subarea.
- The City would explore public/private and public/public partnerships for redevelopment that might help to encourage and catalyze growth.
- The City would prioritize investment of capital improvements related to transportation, infrastructure, public parks, and other facilities in the subarea to support growth for the next twenty years and over the long term.

3.2.4 Significant Unavoidable Adverse Impacts

Implementation of Alternative 4—Preferred Alternative would provide increased opportunities for housing, including affordable housing and a variety of housing choices to fit various income levels. Redevelopment also would create jobs and economic development opportunities over time.

With the planned growth in the subarea, some single family homeowners may decide to move because of concerns over how the neighborhood may change over time, and potential increases in property values could help them in this process. On the other

hand, if property taxes increase, this could be an added burden on some residents.

Overall with the gradual pace of growth expected, continual monitoring of conditions in the subarea by the City, and implementation of the mitigation measures, significant adverse unavoidable impacts would not be anticipated.

The concern with implementing Alternative 1—No Action would be that it is not consistent with adopted goals, policies, and objectives at the state, regional, and local levels to support growth management and integrated land use and transportation planning in high-capacity station areas.

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3.3 Multimodal Transportation

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures for multimodal transportation, including motor vehicle traffic, transit, bicycle, and pedestrian modes. Parking conditions are also analyzed.

3.3.1 Affected Environment

Introduction

Existing conditions of the multimodal transportation network are described and illustrated on the following pages, along with planned conditions for the future, based on adopted transportation plans. It includes an assessment of the current infrastructure and operating conditions for all transportation modes. Additionally, in this section, impacts to transportation facilities and services resulting from the proposed land use alternatives will be assessed to determine applicable mitigation measures needed to accommodate the changes. In order to provide relevant details and constructive analysis, the project team conducted field visits, utilized existing data (such as traffic counts and transit timetables) and reviewed relevant plans for the area, including:

- 2013 Sound Transit Draft Environmental Impact Statement (DEIS) for the Lynnwood Link Extension
- City response letter to the 2013 Sound Transit Draft Environmental Impact Statement (DEIS) for the Lynnwood Link Extension
- 2011 Shoreline Transportation Master Plan (TMP) and amendments
- 2012 Shoreline Comprehensive Plan (CP)
- City of Shoreline Vision 2029 Plan
- City of Shoreline 2014-2019 Capital Improvement Plan (CIP)
- City of Shoreline 2015-2020 Transportation Improvement Plan (TIP)
- 2013 PSRC Growing Transit Communities Report (GTC)
- King County Metro Strategic Plan 2012
- Community Transit Long Range Plan 2011
- Sound Transit Long Range Plan 2005
- Point Wells Expanded Traffic Impact Analysis Report 2011

Existing Street Network

Regional Access

Interstate 5 (I-5) is a limited access freeway classified as a highway of statewide significance. It provides access from the subarea south to Northgate, the University District, Capitol Hill, Downtown Seattle, and beyond, as well as to Mountlake Terrace,

Lynnwood, and points north. Additionally, I-5 serves as the key corridor for express regional bus service in the area. The nearest access points to I-5 from the subarea are the NE 145th Street, NE 175th Street, and NE 205th Street interchanges.

Subarea Street Network

SR-99/Aurora Avenue N is a managed access highway and is also classified as a highway of statewide significance. It serves as a principal arterial in Shoreline. It lies directly west of the subarea, providing north-south mobility and business access along the corridor.

The principal arterials in the subarea are N-NE 175th Street and 15th Avenue NE, which form the southern and eastern edges. Minor arterials within the subarea include Meridian Ave N, N-NE 185th Street, and the portion of 5th Avenue NE south of NE 185th Street. **Figure 3.3-1** highlights the street classifications of the roadways within the subarea. The proposed light rail station location is identified on the map along with the proposed parking lot to the west of I-5.

The area is composed of a gridded network, with notable gaps across I-5, with the only east-west connections located along N-NE 175th Street, N-NE 185th Street, and N-NE195th Street (pedestrian/bicycle only).

Existing Roadway Operations

Concurrency Management System

The Washington State Growth Management Act (GMA) includes a transportation concurrency requirement. This means that jurisdictions must provide adequate public facilities and services to keep pace with a community's growth over time to maintain the Level of Service (LOS) goals stated in a community's comprehensive plan. The improvements can include capital improvements, such as intersection modifications, or other strategies such as transit service expansion or transportation demand management. As part of the process, a jurisdiction evaluates the operations of roadway segments or intersections in order to determine the relative impact from new development on the transportation network. The City of Shoreline has an adopted concurrency methodology to balance growth, congestion, and capital investment.

Level of Service Criteria for Intersections

A common metric to evaluate intersection operations is average seconds of delay per vehicle, which can be translated into a grade for Level of Service (LOS) as shown in **Table 3.3-1**. An additional metric is the evaluation of a roadway segment via the volume-to-capacity (V/C) ratio, which compares a roadway's expected vehicle demand against the theoretical capacity of that segment. These V/C ratios can also be translated into a LOS grades as shown in the table**.** The LOS concept is used to describe traffic operations by assigning a letter grade of A through F, where A represents free-flow conditions and F represents highly congested conditions. The City has adopted LOS D for signalized intersections on arterials, unsignalized intersecting arterials, and roadway segments on Principal and Minor Arterials[1].

[1] Average delay at signalized intersections is based on all vehicles that approach the intersection. Average delay for unsignalized intersections is based on the delay experienced by vehicles at the stop-controlled approaches.

Traffic Volumes

The existing conditions analysis uses data where available from the 2011 update to the TMP to describe current traffic operations, and supplements that information with more recent vehicle counts. As shown in **Figure 3.3-2** and detailed in **Table 3.3-2**, traffic volumes and congestion on streets bordering the proposed station are low, with V/C ratios below 0.8 for the PM peak period. The current LOS standard for a V/C ratio on Principal and Minor arterials within the City of Shoreline is 0.9. 5th Avenue NE to the north and south of NE 185th Street has fewer than 5,000 average daily traffic (ADT) volumes and experiences low levels of congestion. Within the subarea, the most congested corridors include N-NE 175th Street and Meridian Avenue N, with V/C ratios in the PM peak period between 0.8 and 0.9. N 175th Street carries the highest volumes, with over 30,000 ADT on the segment west of I-5, while it is substantially less east of I-5 with 18,000 ADT.

Intersection Evaluation

While standard traffic analysis techniques[2] indicate that all intersections currently operate within the City's adopted LOS standard, there are certain areas where congestion is noticeably higher, such as the intersections of Meridian Avenue N and N 175th Street, and Meridian Avenue N and N 185th Street as shown in **Figure 3.3-3**. Visual inspection of these intersections in the field suggests a higher level of peaking and long queues (10 to 30 vehicles) during the PM peak period.

Collision History

As shown in the **Figure 3.3-4**, there are a relatively low number of vehicle collisions within the subarea, with all intersections experiencing a crash rate below 1.0 per million entering vehicles (MEV). Intersections that experience a crash rate above 1.0 per MEV are deemed "High Accident Locations" based on standards specified in the Sound Transit DEIS. The only intersection with a crash rate near that threshold is at N 175th Street and Meridian Avenue N, with a value of .81. Between 2008 and 2011, this intersection had a yearly average of 4.80 accidents with property damage only and 4.00 accidents with injuries. No accidents with fatalities occurred within the subarea for the time period of 2008 to 2011. All other intersections in the subarea averaged below a combined 5.00 accidents per year. During this period, the only recorded pedestrian accident occurred at NE 175th Street and 5th Avenue NE. Bicycle accidents occurred in the subarea at the intersections of NE 175th Street and 5th Avenue NE, N 175th Street and Meridian Avenue N, and N 185th Street at Meridian Avenue N[3].

[2] Using the HCM 2010 methodology

[3] Information provided by Sound Transit DEIS for the Lynnwood Link Extension

Table 3.3-1 Level of Service Criteria For Intersection and Roadway Analysis

Level of Service (LOS)	Signalized Intersection Delay per Vehicle (seconds)	Unsignalized Intersection Delay per Vehicle (seconds)	Roadway Segment Volume-to-Capacity ratio (V/C)
A	**< 10**	**< 10**	**<.60**
B	**> 10 to 20**	**> 10 to 15**	**.60 - .70**
C	**> 20 to 35**	**> 15 to 25**	**.70-.80**
D	**> 35 to 55**	**> 25 to 35**	**.80 - .90**
E	**> 55 to 80**	**> 35 to 50**	**.90 – 1.0**
F	**> 80**	**> 50**	**> 1.0**

Source: 2010 Highway Capacity Manual and the 2011 City of Shoreline Transportation Master Plan

Table 3.3-2 Average Daily Traffic and PM Peak Hour Congestion for Existing Conditions

Street	Segment	Average Daily Traffic	PM Peak Hour Volume[4]	Volume-to-Capacity Ratio
East-West Corridors				
N 175th Street	West of I-5	30,770	1,135	.86
NE 175th Street	East of I-5	18,010	742	.56
N 185th Street	West of I-5	9,700	497	.64
NE 185th Street	East of I-5	7,130	380	.48
North-South Corridors				
5th Avenue NE	South of N 185th Street	3,360	159	.23
15th Avenue NE	North of N 175th Street	15,040	1,068	.56
Meridian Avenue N	North of N 175th Street	12,070	745	.85

Source: 2011 City of Shoreline Transportation Master Plan and updated traffic counts from 2013

[4] One-directional volume only, signifying the direction with the highest volume

Figure 3.3-1 Street Classifications in the Subarea

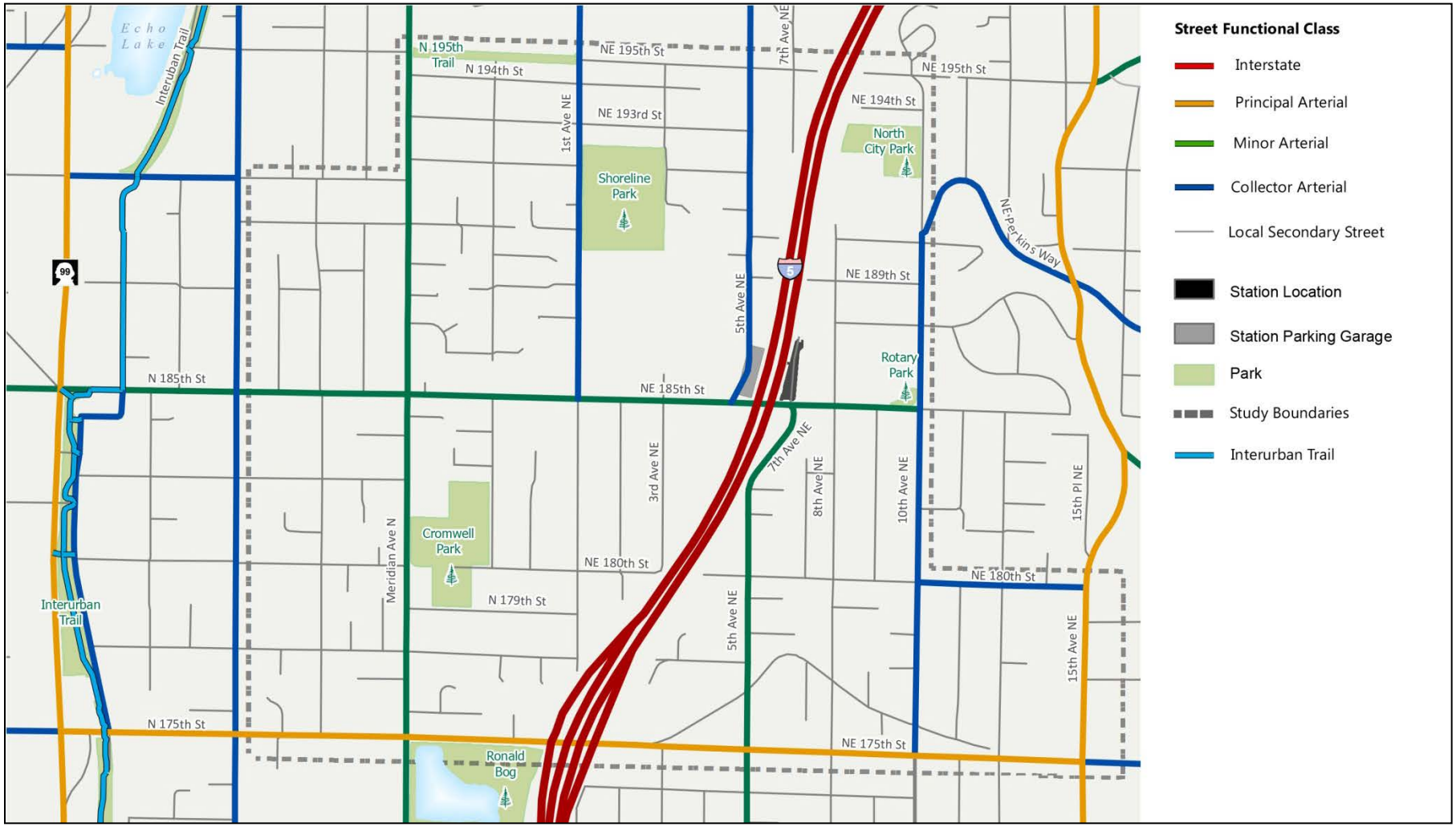


Figure 3.3-2 Average Daily Traffic and PM Peak Congestion (Existing Conditions)

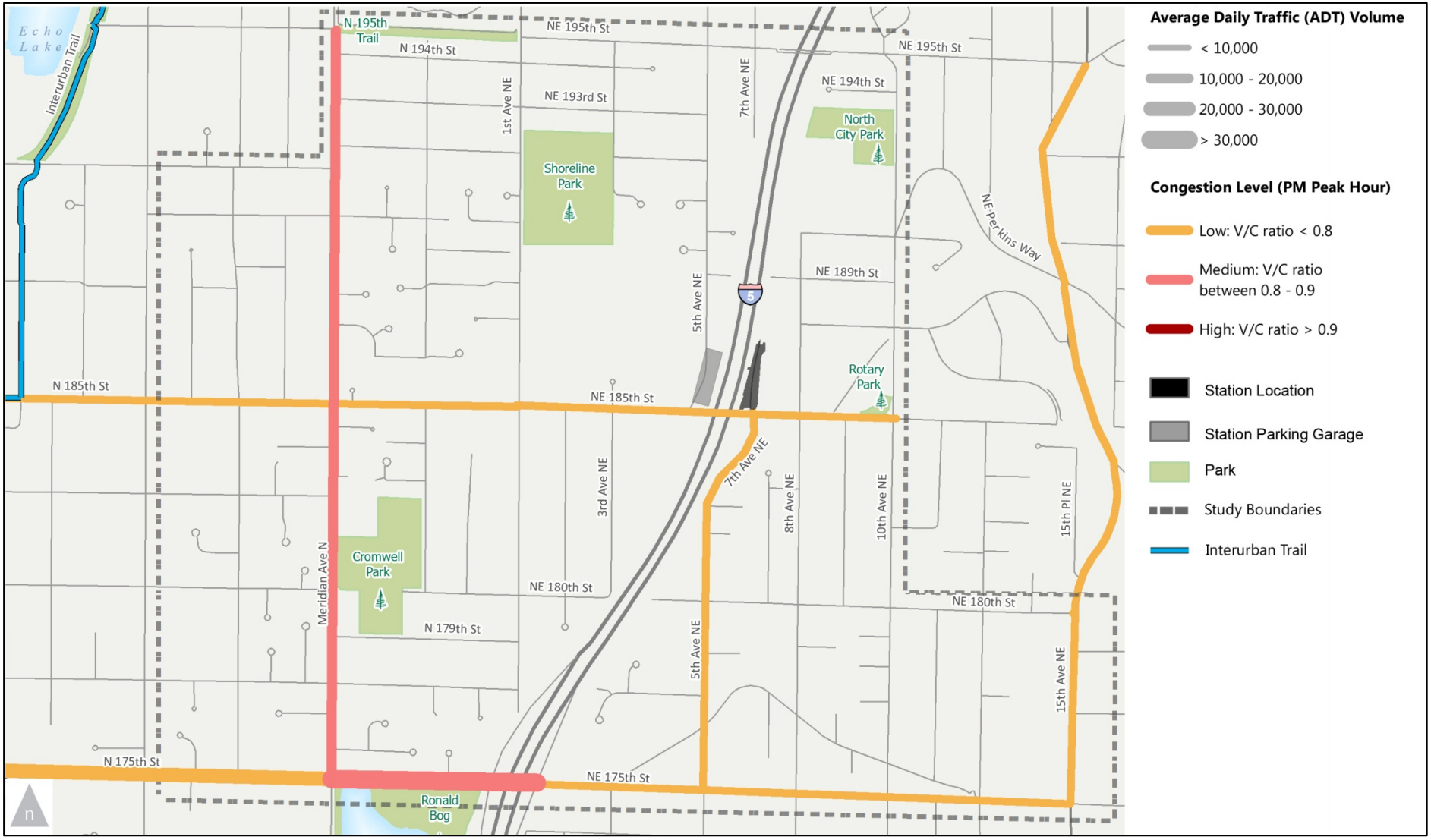


Figure 3.3-3 Intersection Level of Service (Existing Conditions)

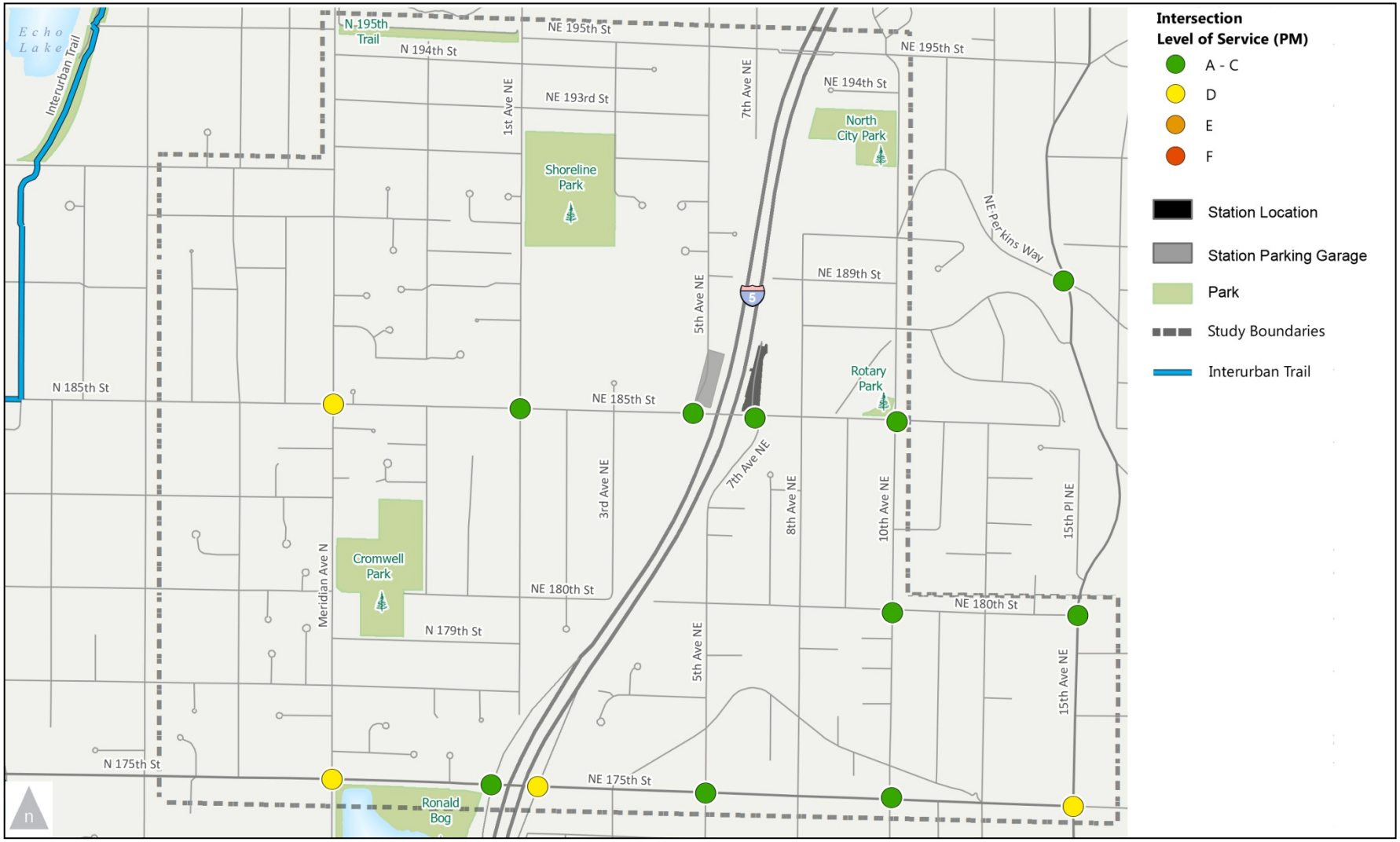
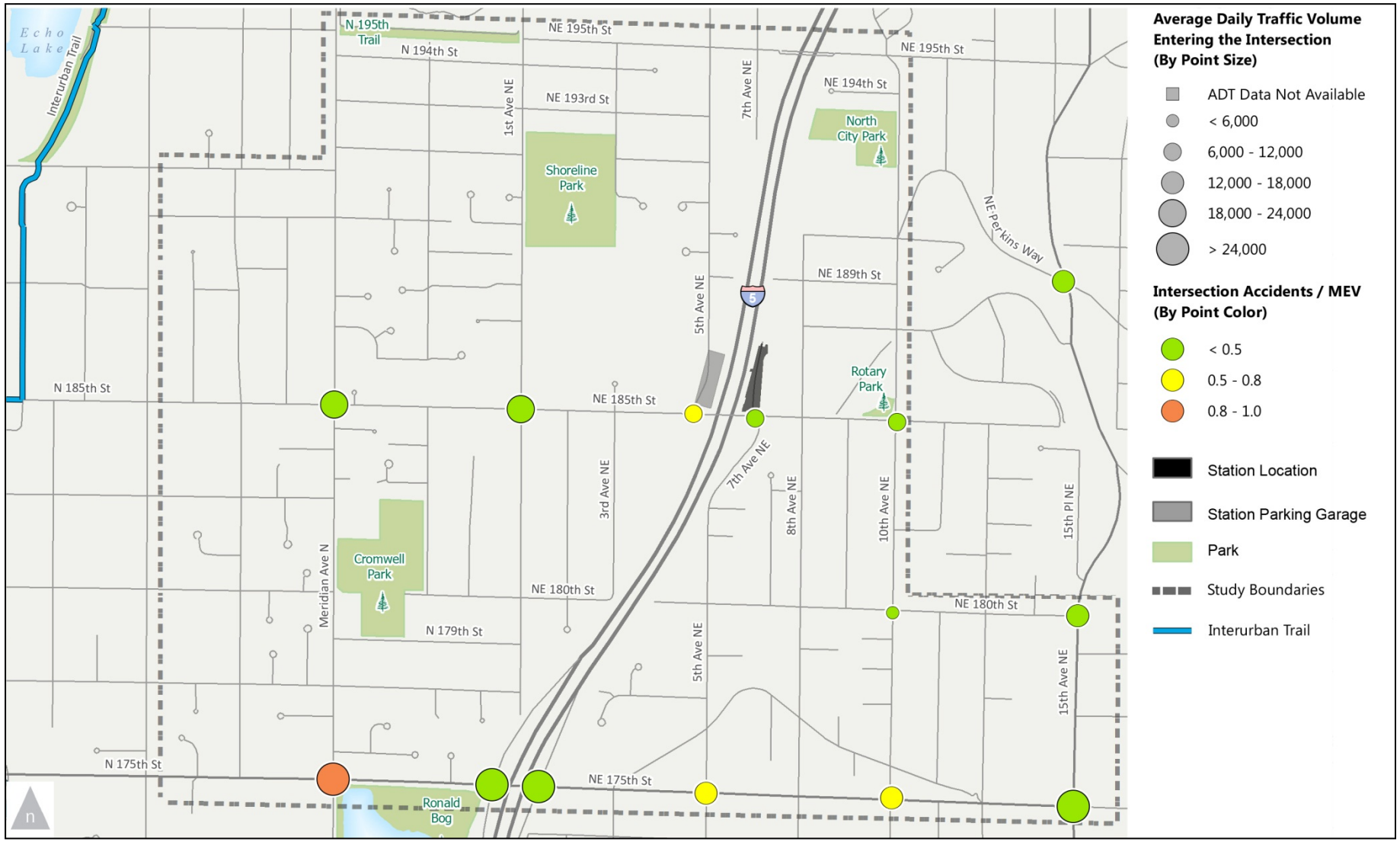


Figure 3.3-4 Accident Rate (Existing Conditions)



Transit Service Provision

Existing Conditions

The transit coverage within the subarea is provided by King County Metro. **Table 3.3-3** details the current headways and destinations serviced by routes that traverse near the proposed station, while **Figure 3.3-5** highlights the location of the routes. Most of the area is within a half-mile walk from a transit stop served during the peak periods. Direct service to the future light rail station location is currently provided by Route 348, with 30 minute headways during the peak and midday periods. There is a gap in east-west service during the off-peak periods, in part due to the low residential densities in the area, limited east-west arterials and lack of I-5 crossings, with the only service provided along N-NE 185th Street. The North City area along 15th Avenue NE is served by 30 minute peak and midday headways, and the combined frequency on NE 175th Street between 5th Avenue NE and 15th Avenue NE is every 15-20 minutes due to multiple routes serving that location.

Planned Transit Service

While the City of Shoreline does not have direct control over the transit service within its boundaries, a number of conceptual modifications with light rail deployment are identified in the TMP. This includes a potential diversion of existing routes to focus service on east-west connections to the station. As part of this process, the City will be engaged with Community Transit, King County Metro, and Sound Transit over the next two years as part of the development of a Transit Service Integration Plan. Community Transit is considering the future 185th station as a potential route terminus for the Swift Bus Rapid Transit line, which provides service to Everett along SR-99, and this assumption was incorporated into the Sound Transit DEIS. The Sound Transit DEIS analysis also assumed that five King County Metro routes would serve the 185th Street station with 15 minute peak headways and 15-30 minute off-peak headways.

Table 3.3-3 Existing Transit Service

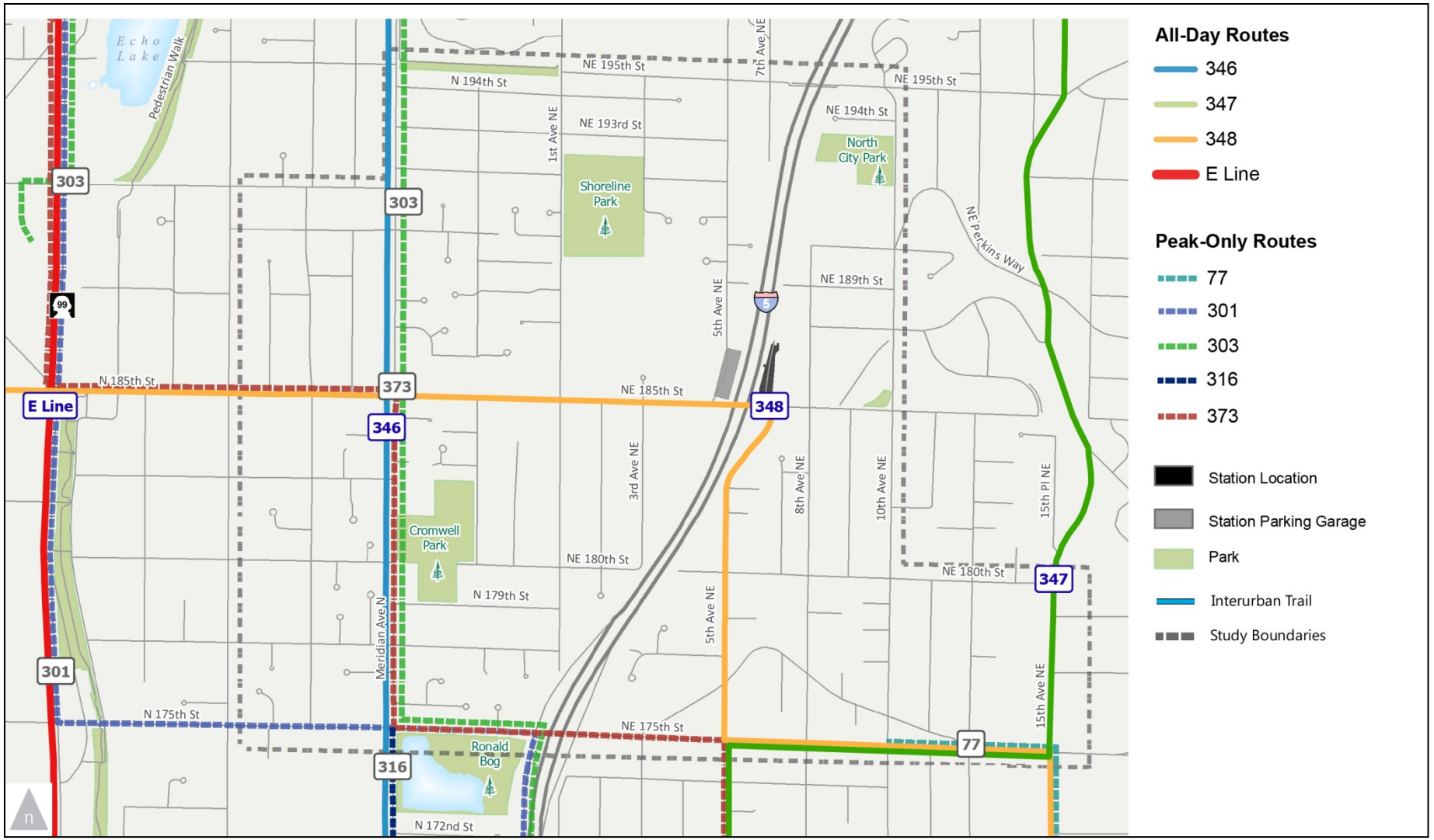
Route	Weekday Headways (in minutes)				Destinations Serviced
	AM Peak (6-9am)	Midday	PM Peak (3-6pm)	Evening	
All-day Routes					
346	30	30	30	60	Aurora Village Transit Center, Meridian Park Northgate
347	30	30	30	60	Northgate, Ridgecrest, North City, Mountlake Terrace
348	30	30	30	60	Richmond Beach, North City, Northgate
E Line	5-12	12	5-12	12-20	Downtown Seattle, Aurora Village Transit Center
Peak Period Routes					
77	15-25	-	15-30	-	North City, Maple Leaf, Downtown Seattle
301**	15	-	15	-	NW Shoreline, Aurora Village Transit Center, Shoreline Park and Ride, Downtown Seattle
303	15	-	15	60*	Shoreline Park and Ride, Aurora Village Transit Center, Meridian Park, Northgate, Downtown Seattle, First Hill
316	15-20	-	15-25	-	Meridian Park, Bitter Lake, Green Lake, Downtown Seattle
373	15	-	15	60*	Aurora Village Transit Center, Shoreline Park and Ride, Meridian Park, Maple Leaf, University District,

Source: King County Metro, 2014

*One outbound trip to Shoreline after 6 pm

** Provides limited bi-directional service during the AM and PM peak periods

Figure 3.3-5 Existing Transit Service



Existing Parking Conditions

Existing On-Street Parking Conditions

A substantial portion of the subarea is residential in character and has no on-street parking restrictions. A survey conducted for the Sound Transit DEIS evaluated parking supply and utilization for an area within a quarter-mile of the proposed station[5]. The analysis determined that there were 700 unrestricted on-street spaces and 300 off-street spaces in total with a utilization rate of 11 percent for the on-street spaces and 43 percent for the off-street locations. However, due to the limitations of the midday evaluation and the geographic area covered, a qualitative assessment was conducted for this EIS during the periods in which residential on-street parking utilization is typically higher, such as evenings and weekends. Within the entire subarea, there are approximately 5,900 on-street spaces available. Utilization was observed to be between approximately 10 percent and 20 percent for a majority of the non-arterial streets, with higher utilization observed near the North City area[6].

Park-and-Ride Facilities

Currently there are a number of smaller lots leased by King County Metro for park-and-ride facilities located at the southern edge of the subarea. This includes the 116 space lot at 1900 N 175th Street and the 25 space lot at 17920 Meridian Ave N. They are typically filled between 96 percent to over 100 percent of capacity on weekdays[7]. As part of the Lynnwood Link Extension Preferred

An example of low on-street parking utilization along residential streets in the station area

Alternative, a 500 parking space facility potentially would be located on the western edge of I-5 just north of NE 185th Street in the Washington State Department of Transportation right-of-way. The Sound Transit DEIS assumed that the garage would be fully utilized during the weekday daytime hours. During the PM peak hour, the DEIS estimated that 180 vehicles would exit the garage and 45 would enter. During the AM peak hour, it was estimated that 200 vehicles would enter the garage and 50 would exit.

[5] Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.
[6] Observations were conducted in May 2014 on a Sunday between 7 am and 8 am.
[7] King County Metro Park and Ride utilization report First Quarter 2014

Existing Pedestrian and Bicycle Facilities

Existing Conditions

The subarea includes a variety of bicycle facility types, including sharrows, bike lanes, and separated paths. **Figure 3.3-6** details the current sidewalk and bicycle infrastructure while highlighting some gaps in connectivity within the station area. Currently, sharrows are present on some streets but there are no sidewalks or bicycle lanes connecting the North City area or areas south of NE 175th Street to the proposed station. Additionally, many of the local streets lack sidewalk coverage (although, it should be noted that traffic volumes tend to be low; so lacking sidewalk coverage may not be perceived as an issue).

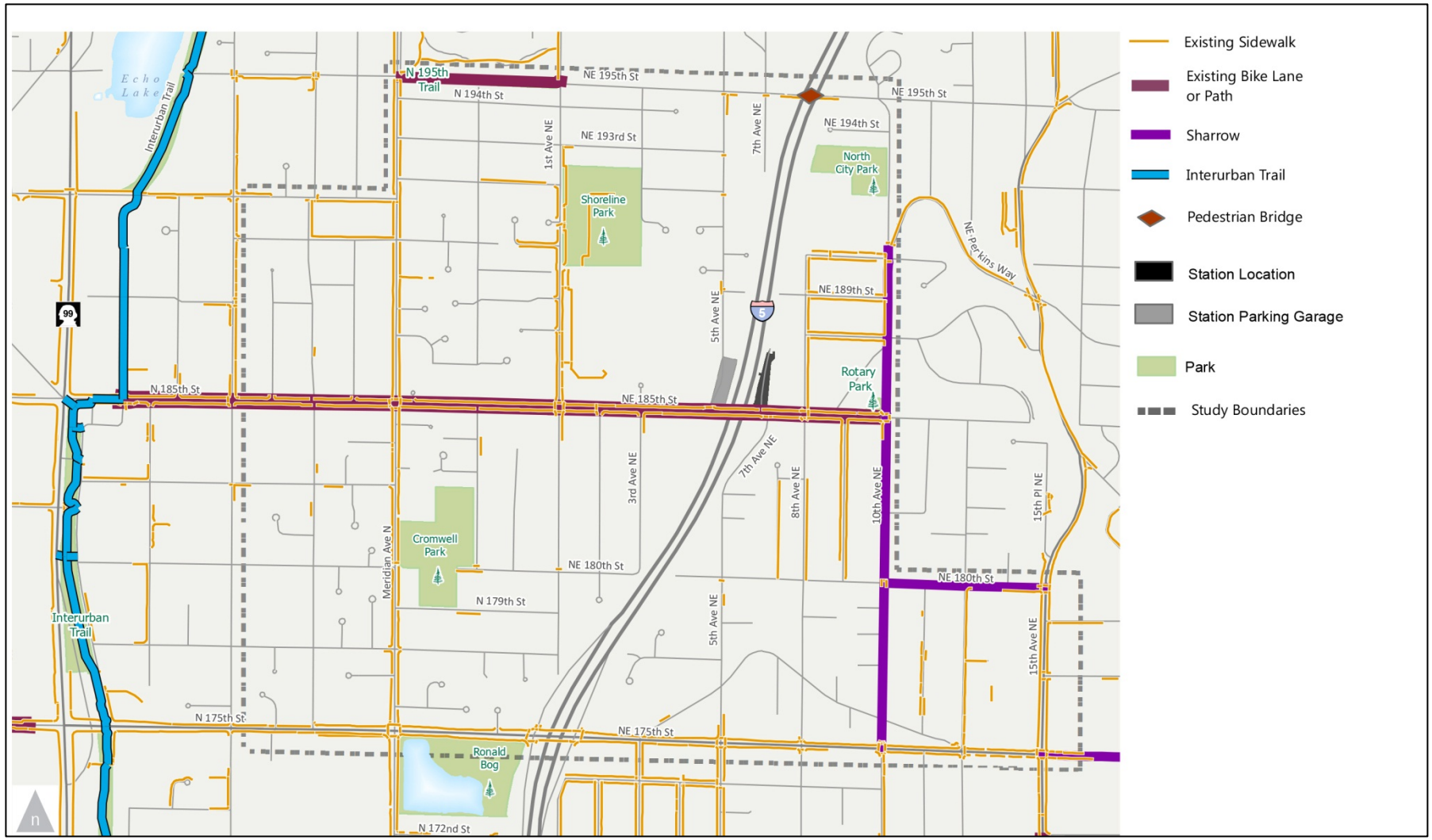
The neighborhoods within the subarea were primarily developed from the 1940s through the 1970s when the area was part of unincorporated King County. The street standards at that time did not require sidewalks, and as such, most of the non-arterial streets today do not have them. Bicycle lanes are not present on non-arterial streets as well.

When the City of Shoreline incorporated in 1995, it assumed jurisdiction of this area. The City works with the community to identify and prioritize capital transportation and infrastructure improvements throughout the city through development of the TMP, Transportation Improvement Plan, and Capital Improvement Plan.

Existing N 195th Street Trail

Recently completed bicycle lanes along NE 185th Street

Figure 3.3-6 Existing Pedestrian and Bicycle Facilities



Planned Multimodal Transportation Improvements

Pedestrian and Bicycle Improvements

The 2011 TMP identified a number of nonmotorized improvements within the subarea, some of which have recently been completed or are currently funded. The Interurban-Burke Gilman Connector on N-NE 195th Street, 10th Avenue NE and NE Perkins Way, as shown in **Figure 3.3-7**, is currently funded. This connector is a combination of on-street facilities, off-street trails, and signage to assist cyclists in navigating between the two major regional trails. Sound Transit will need to reconstruct the NE 195th Street pedestrian and bicycle bridge that crosses Interstate 5, as construction of the light rail alignment will necessitate its removal.

Figure 3.3-8 details the City's Pedestrian System Plan contained within the TMP, including dedicated north-south connections along 5th Avenue NE and Meridian Avenue N. This plan includes both existing sidewalks as well as those needed in order to create a complete pedestrian network in Shoreline. Planned sidewalks would provide a connection from the light rail station to the North City neighborhood through NE 180th Street and 10th Avenue NE. The Lynnwood Link Extension Preferred Alternative includes pedestrian improvements to the NE 185th Street bridge in order to provide a more comfortable walking environment and to connect the parking garage with the station.

Vehicle Traffic Improvements

Figure 3.3-9 highlights projects identified in the TMP that are needed to accommodate future planned growth and maintain the City's adopted transportation level of service standard. The two intersections of N 175th Street and N 185th Street along Meridian Avenue N have been identified for improvements (extended turn pockets, lane rechannelization, and signal coordination). Plans also call for the reconfiguration of Meridian Avenue N to allow for a two-way left turn lane from N 145th Street to N 205th Street. N 175th Street would have a similar treatment from Stone Avenue N to Meridian Avenue N. The TMP also identifies rechannelization of NE 185th Street with a two-way left turn lane from 1st Avenue NE to 10th Avenue NE to accommodate future traffic growth. Sound Transit has listed in the Lynnwood Link DEIS the following potential traffic improvements, some of which are consistent with the City's TMP planned projects.

Traffic Improvements Listed in Lynnwood Link DEIS by Sound Transit

Intersection	Potential Mitigation
N 185th Street / Meridian Avenue N	Add protected permissive phasing to the northbound and southbound left-turns
NE 185th Street / 5th Avenue NE (west of I-5)	Add a two-way left-turn lane or refuge area on 185th Street
NE 185th Street / 5th Avenue NE (east of I-5)	Add a two-way left-turn lane or refuge area on 185th Street
NE 185th Street / 7th Avenue NE	Add a two-way left-turn lane or refuge area on NE 185th Street
NE 185th Street / 10th Avenue NE	Add a right-turn pocket to the eastbound approach

Figure 3.3-7 Bicycle System Plan from the Transportation Master Plan

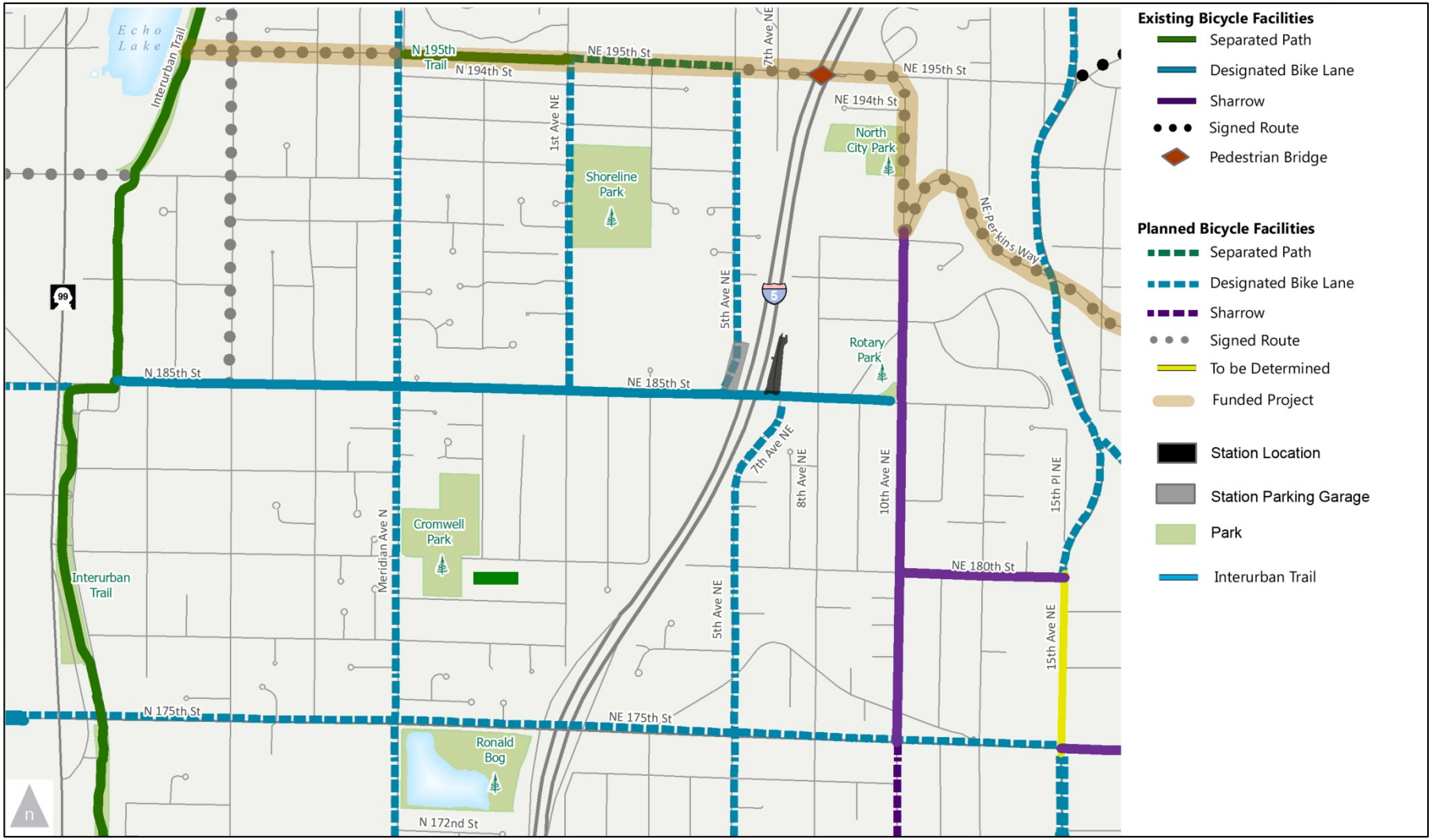


Figure 3.3-8 Pedestrian System Plan from the Transportation Master Plan

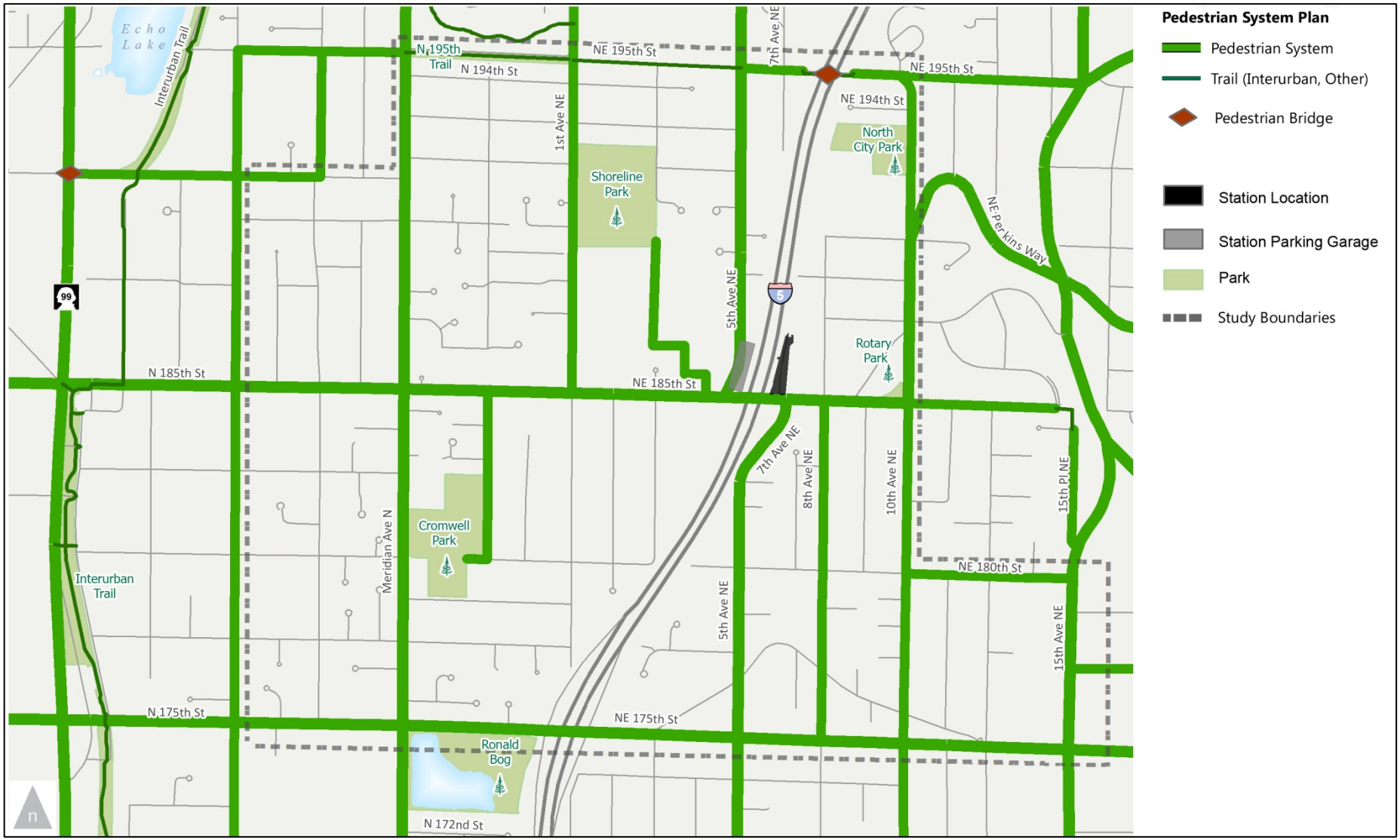
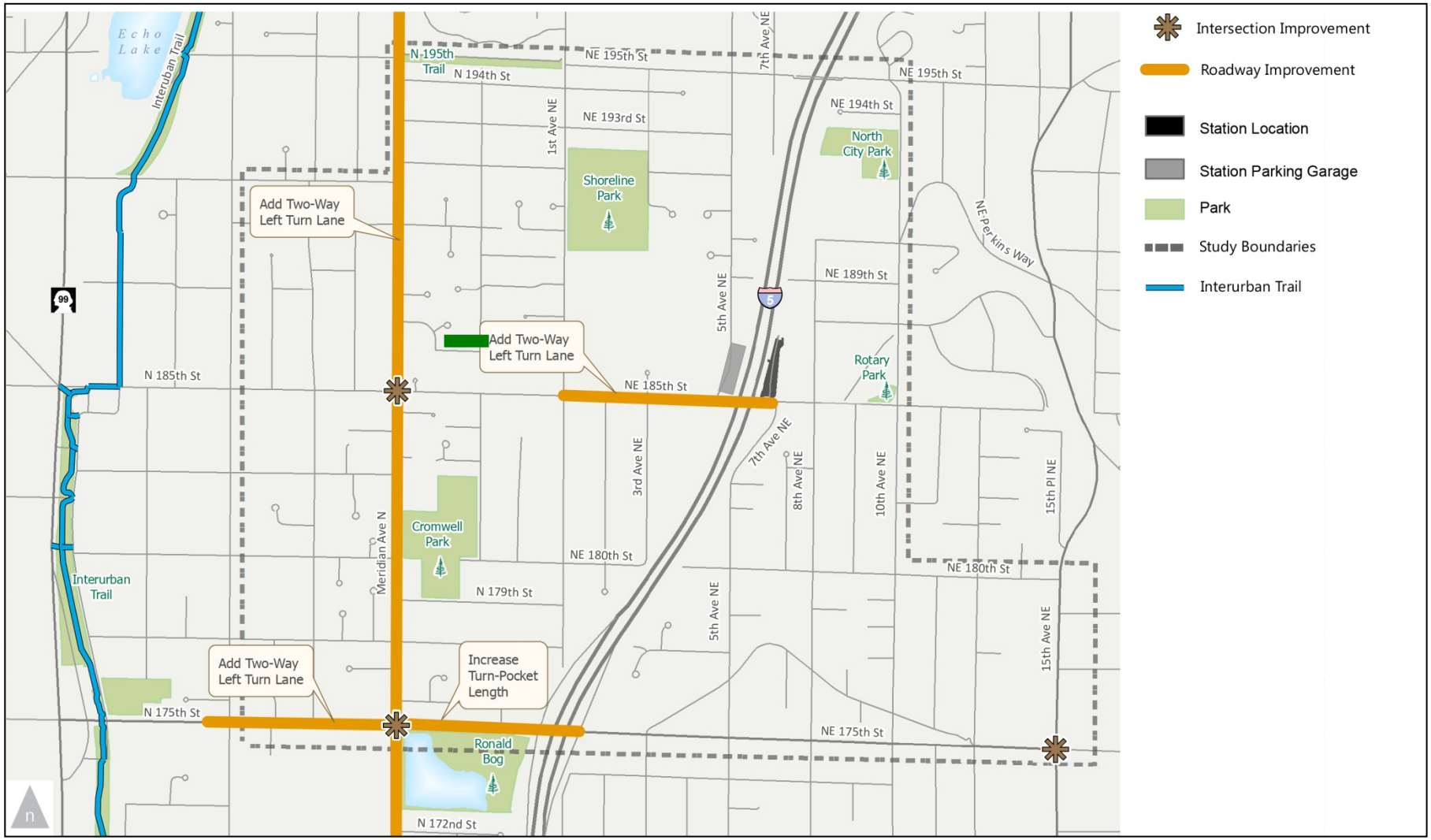


Figure 3.3-9 Roadway Improvements to Accommodate Growth Identified in the Transportation Master Plan



3.3.2 Analysis of Potential Impacts

Introduction

This section describes potential impacts as a result of changes in land use within the subarea. It includes a description of the forecast methodology as well as a detailed account of the results of the transportation impact analysis. The four alternatives evaluated during this process included:

- **Alternative 4—Preferred Alternative**, which envisions an additional 23,554 households and 15,340 jobs total in the subarea, building out in 80 to 125 years or more.
- **Twenty Year/2035,** for which the analysis addresses potential impacts through 2035 and provides recommended mitigation measures/capital improvement projects to support this growth (4,450 to 5,500 households and 1,950 to 2,370 jobs). Given the growth rate applied, the twenty year projection would be the same regardless of which action alternative is implemented.
- **Alternative 3—Previous Most Growth**, which envisions an additional 15,548 households and 27,050 jobs total in the subarea, building out in 60 to 100 years or more.
- **Alternative 2—Some Growth**, which envisions an additional 7,296 households and 9,750 jobs total in the subarea, building out in 30 to 50 years or more.
- **Alternative 1—No Action**, which assumes that there would be minimal growth within the subarea based upon existing zoning designations with the total forecast of 3,639 households and 1,736 by 2035 in the subarea.

Forecasts

Baseline Forecasts

In order to determine the transportation-related impacts of the various land use alternatives, traffic volumes were forecast based on changes in development intensity within the subarea. The 2011 TMP update included forecasts of year 2030 traffic volumes. These forecasts were based on a transit-oriented land use scenario in which much of the city's future housing and employment growth was directed to multiple transit nodes within the city, including the 185th Street Station subarea.

In order to reflect a true "no action" alternative as a baseline for analyzing the potential impacts of the proposed land use changes in the subarea, the travel model was re-run utilizing a "Dispersed" land use scenario, which directed future growth more evenly throughout the city based on existing zoning and observed development patterns. Because the travel model provided forecast traffic volumes for year 2030, the traffic volumes were increased by 0.5 percent to reflect estimated 2035 volumes, in order to be consistent with the land use horizon year. In addition, the future year forecasts were adjusted to account for vehicle trips associated with the Point Wells planned development[8]. Trips forecast in the Point Wells Expanded Traffic Impact Analysis were added on top of the alternatives, including Alternative 4—

[8] The Point Wells planned mixed-use development is a 61 acre site located in an unincorporated portion of Snohomish County adjacent to the northern border of Shoreline and the Puget Sound.

Preferred Alternative, Alternative 3—Previous Most Growth, Alternative 2—Some Growth, and Alternative 1—No Action.

To analyze how the three action alternatives (Alternatives 4, 3 and 2) would result in different travel patterns due to their mix of land uses and connectivity, the project team used an innovative trip generation analysis technique known as the mixed-use development (MXD) model. The MXD model is based on a growing body of research, which focuses on the relationship between travel and the built environment. This method supplements conventional trip generation methods to capture effects related to built environment variables (known as the Ds) like **d**ensity, **d**iversity of land uses, **d**estinations (accessibility), **d**evelopment scale, pedestrian and bicycle **d**esign, **d**istance to transit services, and **d**emographics. ***The model correlates density and high-capacity transit ridership, reinforcing how density can support transit.***

> The MXD analysis is a method for vehicle trip forecasting that more accurately reflects the number of trips that can be completed within a given subarea due to complementary land uses such as residential and retail.

The proposed height and density alternatives in the 185th Street Station Subarea incorporate changes in a number of these variables that, in turn, would influence the neighborhood's travel characteristics. In short, projects with higher densities, a rich variety of land uses close to one another, and high quality pedestrian, bicycle, and transit environments have a lower vehicle trip generation rate. People have more choices in terms of both the travel mode as well as how far they must travel to reach various destinations. The MXD method provides a more reasonable picture of how travel characteristics change over time by avoiding overestimating the number of vehicle trips that infill projects generate.

The MXD method was applied to the station subarea to calculate the number of pedestrian, transit, and automobile trips generated from new development. **Table 3.3-4** highlights the mode split of the PM peak hour trips generated by full development within the subarea. As the table shows, the proposal to increase land use intensity for the Some Growth, Previous Most Growth, and Preferred Alternatives results in a higher proportion of short distance trips that could be made via walking, bicycling, and transit.

To evaluate how streets and intersections in the subarea would operate under the alternatives, traffic volume estimates were developed with the following methodology. For the No Action Alternative, traffic volumes were generated from the "Dispersed" land-use model. The analysis for each of the growth alternatives utilized the No Action traffic volumes plus the additional auto trips related to the land use changes for that alternative. Note that distribution of trips was based on existing travel patterns and expected shifts as a result of regional traffic growth[9].

The MXD method was also applied to the alternatives to evaluate transportation-related greenhouse gas (GHG) emissions associated with each. This GHG calculation considers emissions from motor vehicles only and does not include other emissions related to the built environment. While the Preferred Alternative resulted in more GHG emissions than the No Action Alternative, it should be noted that the No Action Alternative assumed substantially less overall housing and employment.

[9] With adjustments for the extra five years of traffic growth and potential development at Point Wells

To provide a more even comparison amongst the alternatives, a version of the Dispersed land-use model was run with housing and employment growth equivalent to the Preferred Alternative. Under this scenario, the built environment would be similar to the No Action Alternative, which is less conducive to bicycling, walking, and transit and results in more overall vehicle travel.

Similarly, this scenario would generate much higher levels of transportation-related GHG-emissions, as shown in **Table 3.3-4**. In a later section, improvements for the next 20 years are described based on a housing and employment growth rate to 2035. The forecast mode splits, trips generated, and GHG emissions are also identified in **Table 3.3-4**

Table 3.3-4 Percentage of Trips by Mode

Action Alternatives	External Walk/Bike Trips	External Transit Trips	Internal Trips	External Auto Trips	Total PM Peak Trips Generated	External PM Auto Trips Generated	Daily Transportation-Related GHG Emissions
Dispersed Land-Use Model w/ Alt. 4—Preferred Alternative Population and Employment totals	4%	4%	25%	66%	20,111	**13,312**	**640**
Alternative 4—Preferred Alternative	10%	11%	35%	45%	20,111	**8,967**	**320**
First Twenty Years (Up to 2035)	5%	8%	29%	57%	8,289	**4,725**	**169**
Alternative 3—Previous Most Growth	9%	11%	34%	46%	20,370	**9,390**	**308**
Alternative 2—Some Growth	6%	8%	31%	56%	12,310	**6,890**	**211**

Roadway Improvement Assumptions

The TMP planned transportation projects and the projects from the Lynnwood Link DEIS outlined in the previous section were considered in all of the future year scenarios. These improvements included:

- N-NE 185th St: Two-way left-turn lane
- Meridian Ave N: Two-way left-turn lane
- N 185th St / Meridian Ave N: 500 foot northbound and southbound add/drop lanes including a second through lane and receiving lane. 50 foot eastbound right-turn pocket
- Expanded turn pocket lengths for Meridian Ave N and N 175th St intersection
- Intersection improvements at 15th Ave NE and NE 175th St intersection

Alternative 4—Preferred Alternative

Street Access and Circulation

Similar to Alternative 3—Previous Most Growth, changes in redevelopment under the Preferred Alternative would allow for the creation of new internal streets and paths. If redeveloped, the Shoreline Center site could provide additional connections through the site to 3rd Avenue NE or NE 190th Street. Additionally, redevelopment and parcel consolidation in other areas could establish a denser grid of paths for improved pedestrian and bicycle access. However, the area would still be constrained to N-NE 175th Street, N-NE 185th Street, and N-NE 195th Street (pedestrian/bicycle only) as primary connections across I-5.

Collector Arterials (such as 1st Avenue NE, 5th Avenue NE north of 185th Street, NE 180th Street, and Perkins Way) are not subject to the City's concurrency standard. While it is not anticipated that Perkins Way would see substantial traffic resulting from new development within the station area, other Collector Arterials in the subarea may. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification to Minor Arterials.

Traffic Volumes

Under the Preferred Alternative, with full build-out of the proposed zoning, many intersections would fail to meet the City's standard, operating at LOS E or F as shown in **Figure 3.3-10** and **Table 3.3-5**. Intersections along N-NE 185th and N-NE 175th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under this alternative. At this time, it has not been determined how many of these land uses would be accessed directly off of N-NE 185th and N-NE 175th versus from lower classified streets (such as 1st Avenue NE and 5th Avenue NE) or alleyways. Provision of internal circulation routes, which consolidate access, would lessen intersection impacts. The improvements needed to mitigate these impacts are described later in this document.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in trips generated within the subarea would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-6** and **Figure 3.3-11.** Meridian Avenue N, 5th Avenue NE, and N-NE 185th Street would experience the largest percentage change, with growth of between 116 and 260 percent as compared to existing conditions, while the growth along N-NE 175th Street would be between 60 and 72 percent. V/C ratios for many of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total VMT generated from land uses within the subarea under the Preferred Alternative would amount to roughly 525,000 miles per day. In total, future land use and transportation would generate roughly 320 metric tons of CO_2 per day under the Preferred Alternative. In comparison, Alternative 1--No Action would generate approximately 1,110,000 daily VMT and 640 metric tons of CO_2 per day based on existing land use patterns and the anticipated amount of driving.

Transit Service and Mobility

The growth in vehicle traffic would substantially impact overall transit speed and reliability along N-NE 185th Street, Meridian Avenue N, and N-NE 175th Street if no transit priority treatments are provided. Because of a higher amount of density forecasted in the Preferred Alternative, the area could support more routes and more frequent service. Additional transit service may be provided along 10th Avenue NE and NE 180th Street to support a connection between the Aurora Town Center, the light rail station and the North City area. Expanded frequency of service would be supported by the increase in population and employment density. Any new curbs installed along 10th Avenue NE and NE 180th Street should allow for proper curb radii that can accommodate buses.

Parking Conditions

Within the subarea, peak parking demand is expected to be approximately 39,000 spaces more than Alternative 1—No Action (a total of 45,000), with a higher concentration near retail-uses. This amount is a 16 percent reduction from unadjusted demand due to the potential for shared parking between complementary uses. The current zoning code allows for a reduction of up to 25 percent required spaces if there is a shared parking agreement with adjoining parcels or if high-capacity transit service is available within a one-half-mile walk shed, conditions that future development would meet under the Preferred Alternative. Based on existing and future supply provided by new development at current rates specified in the zoning code, approximately 49,700 spaces would exist within the subarea.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed as capital projects or with new development.

City code stipulates that any multifamily residential uses must have a minimum of one short-term bicycle parking space per ten dwelling units, one long-term bicycle parking space per studio or one-bedroom unit, and two per unit having two or more bedrooms. Commercial development must have one short-term bicycle stall per twelve vehicle parking spaces and one long-term space per 25,000 square feet of commercial floor area.

Consolidation of parcels may allow for non-motorized paths to close current gaps in the roadway network and connect to other on- and off-street facilities. That said, significant increase in traffic volumes in the subarea may increase overall bicycle stress for a number of roadway segments. Bicycle connections from the Interurban Trail may be impacted by increased vehicle traffic along N-NE 185th Street, Meridian Avenue N, and 1st Avenue NE, causing a higher bicycling stress environment; more separated facilities may be required.

The subarea plan calls for creating a vibrant, walkable, transit-oriented neighborhood with safe and efficient pedestrian and bicycle access to and from the light rail station, as shown in this conceptual illustration. A shared use path under the power lines along 8th Avenue NE could be a future option for relieving bike stress.

Table 3.3-5 PM Peak Period Intersection Level of Service for the Full Build-out of Alternative 4—Preferred Alternative

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Preferred Alternative LOS	Pref. Alt Delay (sec. / veh.)
Signalized	185th St / Meridian Ave	D	54	D	45	**F**	**>120**
Signalized	185th St / 1st Ave	A	<10	B	14	**F**	**>120**
Unsignalized	185th St / 5th Ave	B	**23**	**F**	**>120**	**F**	**>120**
Unsignalized	185th St / 7th Ave	B	**20**	**E**	**36**	**F**	**>120**
Unsignalized	185th St / 10th Ave	A	11	C	21	**F**	**108**
Signalized	15th Ave / Perkins Way	C	21	D	53	**E**	**59**
Unsignalized	180th St / 10th Ave	A	<10	C	20	**F**	**>120**
Signalized	180th St / 15th Ave	A	<10	C	22	D	38
Signalized	175th St / Meridian Ave	D	51	D	54	**F**	**110**
Signalized	175th St / I-5 SB Ramps	C	**30**	**E**	**79**	**F**	**>120**
Signalized	175th St / I-5 NB Ramps	D	**45**	**F**	**>120**	**F**	**>120**
Signalized	175th St / 5th Ave	C	25	C	26	D	34
Signalized	175th St / 10th Ave	A	<10	B	16	D	48
Signalized	175th St / 15th Ave	D	47	D	53	**E**	**69**

Note: bold numbers signify intersections that would fall below the City's LOS standard.

Figure 3.3-10 Intersection Level of Service
for the Full Build-out of Alternative 4—Preferred Alternative

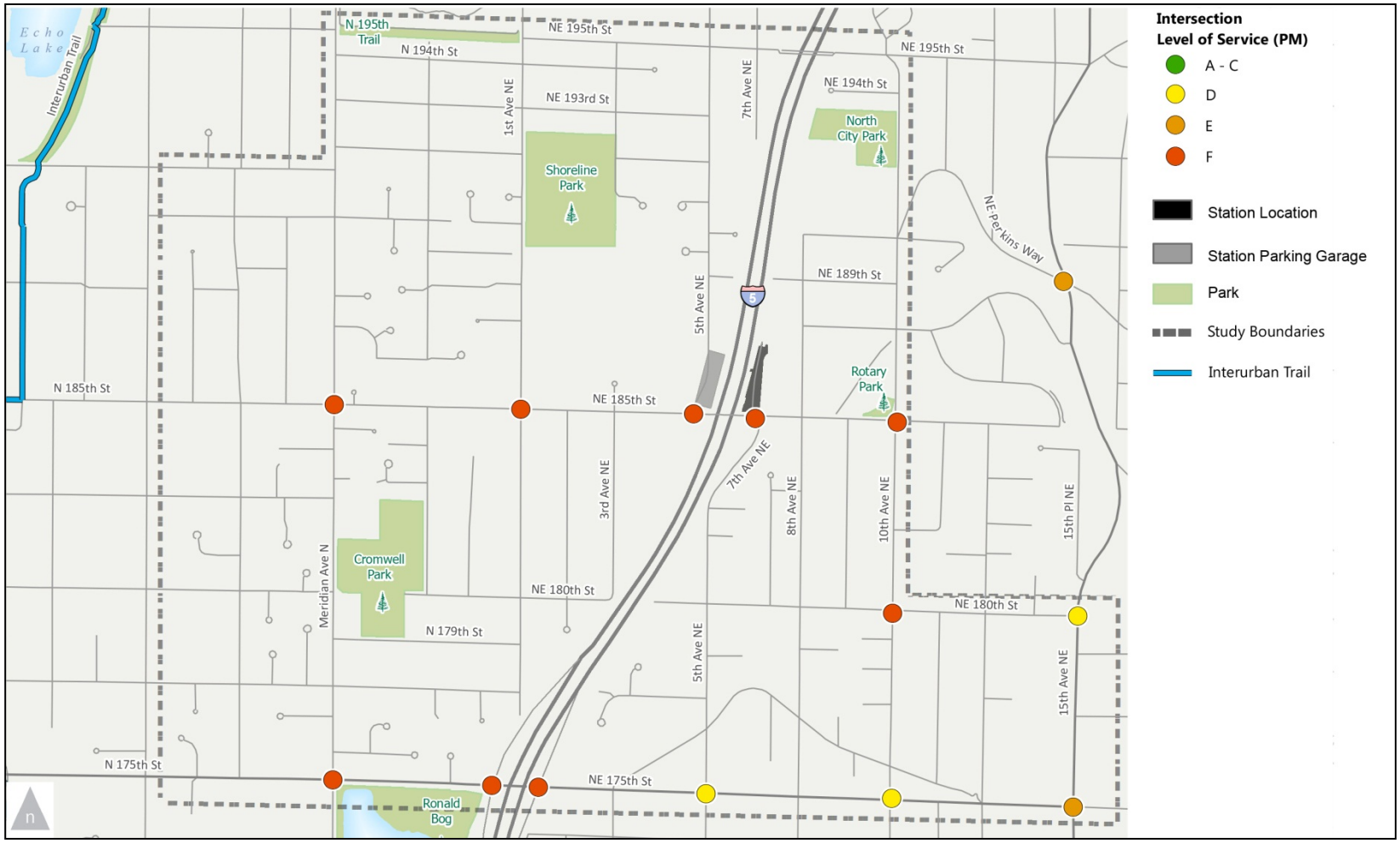
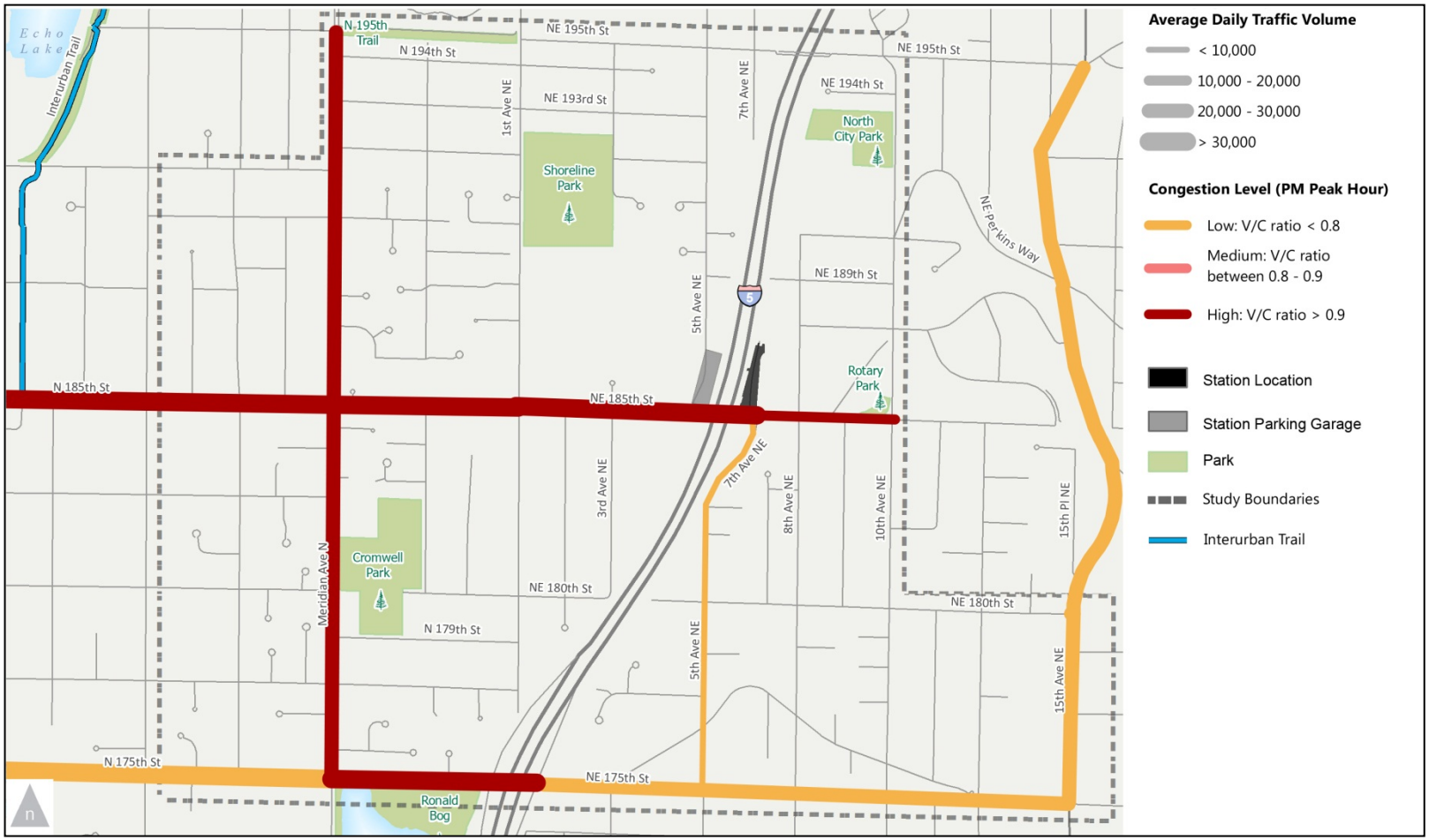


Table 3.3-6 Average Daily Traffic Volumes and PM Peak Period Congestion for the Full Build-out of Alternative 4—Preferred Alternative

Street	Segment	Existing ADT	No Action ADT	Preferred Alt. ADT	Pref. Alt. PM Peak Hour Volume[10]	Preferred Alt. V/C
East-West Corridors						
175th Street	West of I-5	30,770	39,490	52,820	2,115	**>1.0**
175th Street	East of I-5	18,010	21,180	28,590	1,186	0.76
185th Street	West of I-5	9,700	17,180	34,620	1,831	**>1.0**
185th Street	East of I-5	7,130	11,360	17,080	937	**.94**
North-South Corridors						
5th Avenue NE	South of N 185th Street	3,360	5,700	8,770	399	0.57
15th Avenue NE	North of N 175th Street	15,040	20,340	21,610	1,470	0.79
Meridian Avenue N	North of N 175th Street	12,070	15,140	26,100	1,602	**>1.0**

[10] One-directional volume only, signifying the direction with the highest volume

Figure 3.3-11 Average Daily Traffic and PM Peak Congestion for the Full Build-out of Alternative 4—Preferred Alternative



The First Twenty Years (Up to 2035) for Any Action Alternative

Introduction

While the impacts and mitigation measures specified for the Preferred Alternative would occur over the projected 80 to 125 year timespan, this section describes the mitigation measures that would be needed to address impacts in the near-term, specifically over a twenty-year horizon. Given the growth rate applied, the twenty-year projection would be the same for all action alternatives.

Growth Forecast

Based on a 1.5 to 2.5 percent growth rate over the next 20 years, a total of 1,950 to 2,370 employees and 4,450 to 5,500 households would be located within the subarea. The assumed growth rates are based on historical trends in the region and may fluctuate around the average of 1.5 and 2.5 percent annually depending on actual market conditions. Additionally, while the analysis assumed an equal distribution of development throughout the subarea, particular parcels may redevelop at a higher or lower rate than the average. Actual distribution of development would impact where and when specific roadways and areas experience a change in travel patterns.

Average Daily Traffic and Intersection Level of Service

As shown in **Figure 3.3-12** and in **Figure 3.3-13**, additional trips resulting from redevelopment as part of the Preferred Alternative in the subarea would increase average vehicle delay at intersections and along roadways. However, many intersections would still operate at or better than LOS D during the PM peak period. Congestion along N-NE 185th Street would be influenced by actual development patterns and the access routes to the new development. Intersections directly adjacent to the station and the parking garage would most likely require signalization as a result of trips generated specifically for station access, however no added lane capacity would be required at those intersections. While impacts from light rail implementation are addressed in the Lynnwood Link Extension DEIS, the following section identifies specific steps the City may take to address any potential impacts within the subarea.

Figure 3.3-12 Average Daily Traffic and PM Peak Congestion for the First Twenty Years (up to 2035)

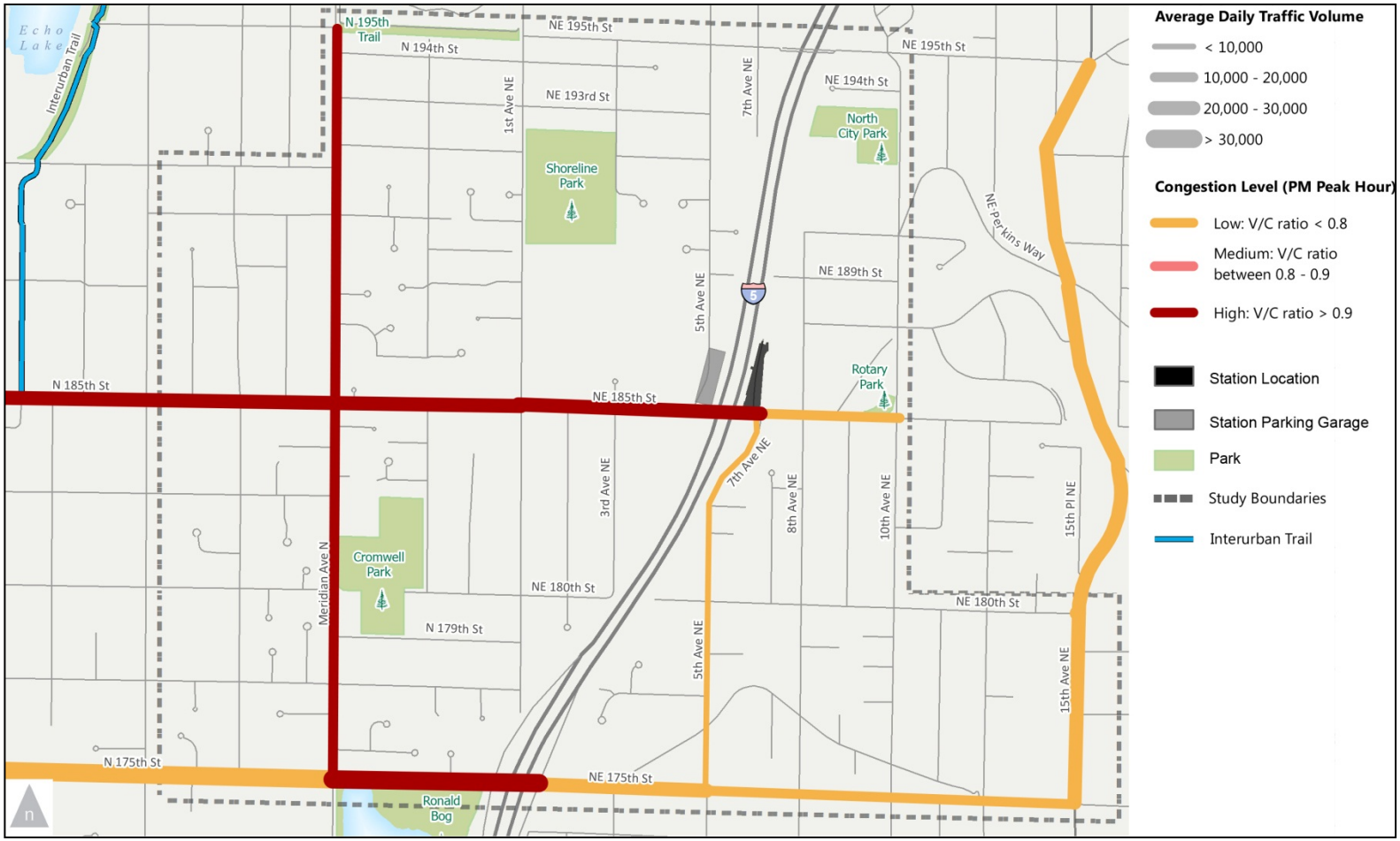
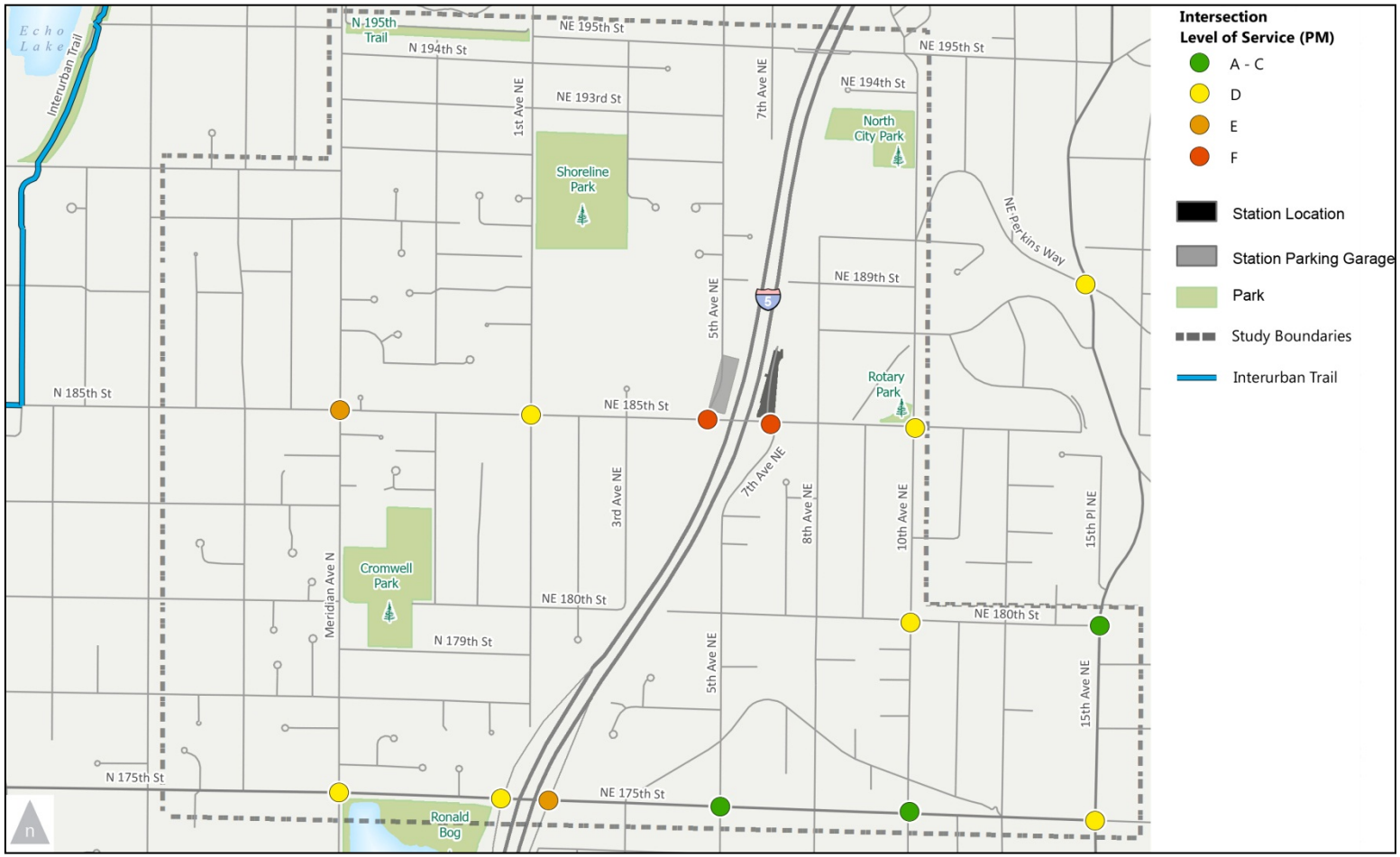


Figure 3.3-13 Intersection Level of Service for the First Twenty Years (up to 2035)



Alternative 3—Previous Most Growth

Street Access and Circulation

Changes in redevelopment under Alternative 3—Previous Most Growth would allow for the creation of new internal streets and paths. The Shoreline Center site could provide additional connections through the site to 3rd Avenue NE or NE 190th Street. Additionally, redevelopment and parcel consolidation in other areas could establish a denser grid of paths for improved pedestrian access. However, the area would still be constrained to N-NE 175th Street, N-NE 185th Street, and N-NE 195th Street (pedestrian/bicycle only) as primary connections across I-5.

Collector Arterials (such as 1st Avenue NE, 5th Avenue NE north of 185th Street, NE 180th Street, and Perkins Way) are not subject to the City's concurrency standard. While it is not anticipated that Perkins Way would see substantial traffic resulting from new development within the station area, other Collector Arterials in the subarea may. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification to Minor Arterials.

Traffic Volumes

Under Alternative 3—Previous Previous Most Growth, with full build-out of the proposed zoning, many intersections would fail to meet the City's standard, operating at LOS E or F as shown in **Figure 3.3-14** and **Table 3.3-7**. Intersections along N-NE 185th and N-NE 175th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under this alternative. At this time, it has not been determined how many of these land uses would be accessed directly off of N-NE 185th and N-NE 175th or from lower classified streets (such as 1st Avenue NE and 5th Avenue NE) or alleyways. Provision of internal circulation routes, which consolidate access, would lessen intersection impacts. The improvements needed to mitigate these impacts are described later in this document.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in trips generated within the subarea would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-8** and **Figure 3.3-15**. Meridian Avenue N, 5th Avenue NE, and N-NE 185th Street would experience the largest percentage change, with growth of between 100 and 250 percent as compared to existing conditions, while the growth along N-NE 175th Street would be roughly 60 percent. V/C ratios for many of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total VMT generated from land uses within the subarea under Alternative 3—Previous Most Growth would amount to roughly 502,000 miles per day. In total, future land use and transportation would generate roughly 308 metric tons of CO_2 per day under Alternative 3—Previous Most Growth. In comparison, Alternative 1--No Action would generate approximately 1,160,000 daily VMT and 630 metric tons of CO_2 per day based on existing land use patterns and the anticipated amount of driving.

Transit Service and Mobility

The growth in vehicle traffic would substantially impact overall transit speed and reliability along N-NE 185th Street, Meridian Avenue N, and N-NE 175th Street if no transit priority treatments are provided. Because of a higher amount of density forecast in Alternative 3—Previous Most Growth, the area could support more routes and more frequent service. Additional transit service may be provided along 10th Avenue NE and NE 180th Street to provide connection between the Aurora Town Center, the light rail station, and North City. Expanded frequency of service would be supported by the increase in population and employment density. Any new curbs installed along 10th Avenue NE and NE 180th Street should allow for proper curb radii that can accommodate buses.

Parking Conditions

Within the subarea, peak parking demand is expected to be approximately 35,000 spaces more than Alternative 1—No Action (a total of 41,000), with a higher concentration near retail-uses. This amount is a 16 percent reduction from unadjusted demand due to the potential for shared parking between complementary uses. The current zoning code allows for a reduction of up to 25 percent required spaces if there is a shared parking agreement with adjoining parcels or if high-capacity transit service is available within a one-half-mileradius, conditions that future development would meet under Alternative 3—Previous Most Growth. Based on existing and future supply provided by new development at current rates specified in the zoning code, approximately 48,000 spaces would exist within the subarea.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed as capital projects or with new development.

City code stipulates that any multifamily residential uses must have a minimum of one short-term bicycle parking space per ten dwelling units, one long-term bicycle parking space per studio or one-bedroom unit, and two per unit having two or more bedrooms. Commercial development must have one short-term bicycle stall per twelve vehicle parking spaces and one long-term space per 25,000 square feet of commercial floor area.

Consolidation of parcels may allow for pedestrian-only paths to close current gaps in the roadway network. That said, significant increase in traffic volumes in the subarea may increase overall bicycle stress for a number of roadway segments. Bicycle connections from the Interurban Trail may be impacted by increased vehicle traffic along N-NE 185th Street, Meridian Avenue N, and 1st Avenue NE, causing a higher bicycling stress environment; more separated facilities may be required.

Table 3.3-7 PM Peak Period Intersection Level of Service for Alternative 3—Previous Most Growth

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Previous Most Growth LOS	Previous Most Growth Delay (sec. / veh.)
Signalized	185th St / Meridian Ave	D	54	D	45	**F**	**>120**
Signalized	185th St / 1st Ave	A	<10	B	14	**F**	**>120**
Unsignalized	185th St / 5th Ave	B	**23**	**F**	**>120**	**F**	**>120**
Unsignalized	185th St / 7th Ave	B	**20**	**E**	**36**	**F**	**>120**
Unsignalized	185th St / 10th Ave	A	11	C	21	**F**	**90**
Signalized	15th Ave / Perkins Way	C	21	D	53	**E**	**60**
Unsignalized	180th St / 10th Ave	A	<10	C	20	**F**	**>120**
Signalized	180th St / 15th Ave	A	<10	C	22	D	43
Signalized	175th St / Meridian Ave	D	51	D	54	**F**	**87**
Signalized	175th St / I-5 SB Ramps	C	**30**	**E**	**79**	**F**	**100**
Signalized	175th St / I-5 NB Ramps	D	**45**	**F**	**>120**	**F**	**>120**
Signalized	175th St / 5th Ave	C	25	C	26	D	37
Signalized	175th St / 10th Ave	A	<10	B	16	C	31
Signalized	175th St / 15th Ave	D	47	D	53	**E**	**72**

Note: bold numbers signify intersections that would fall below the City's LOS standard.

Figure 3.3-10 Intersection Level of Service for Alternative 3—Previous Most Growth

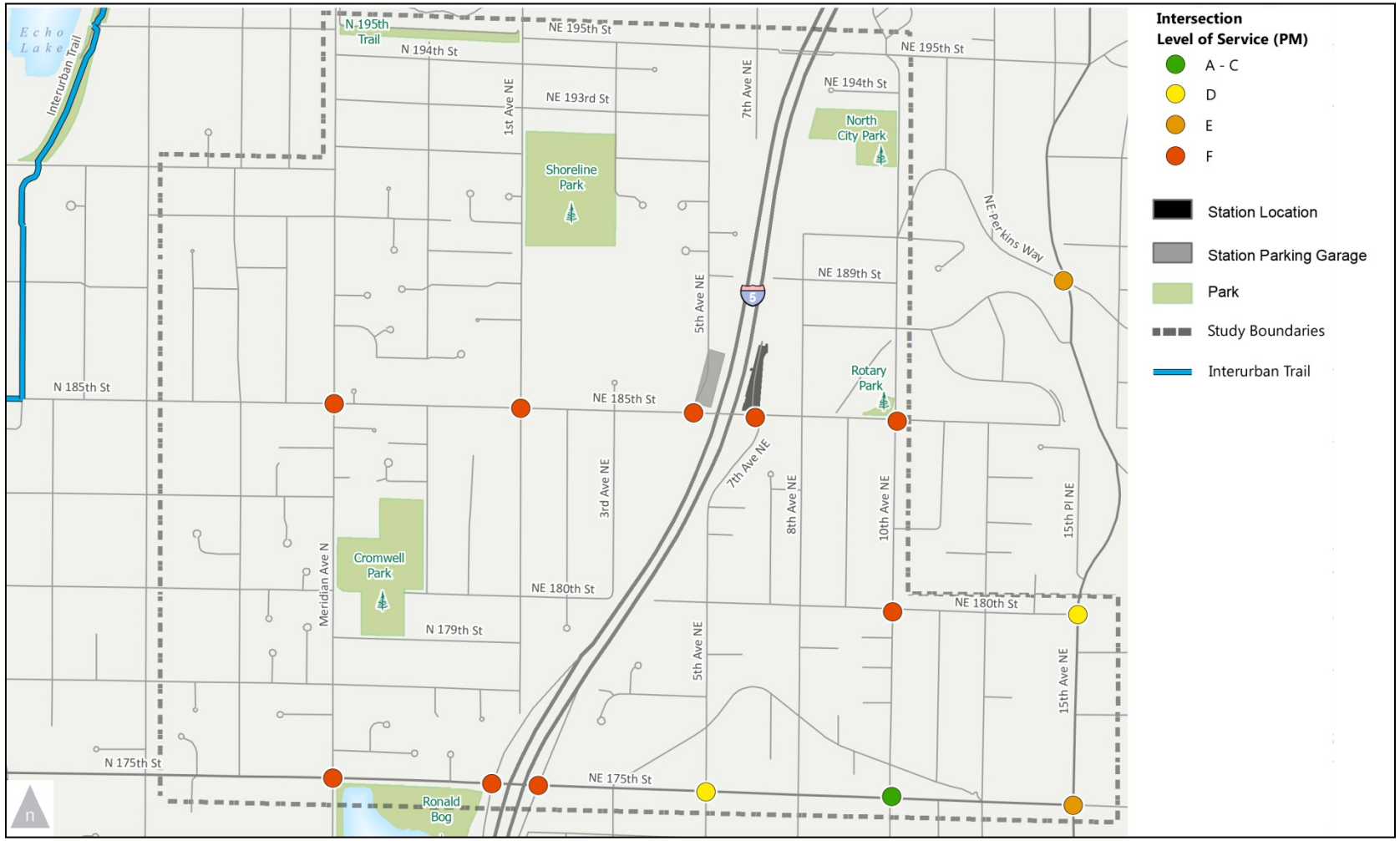
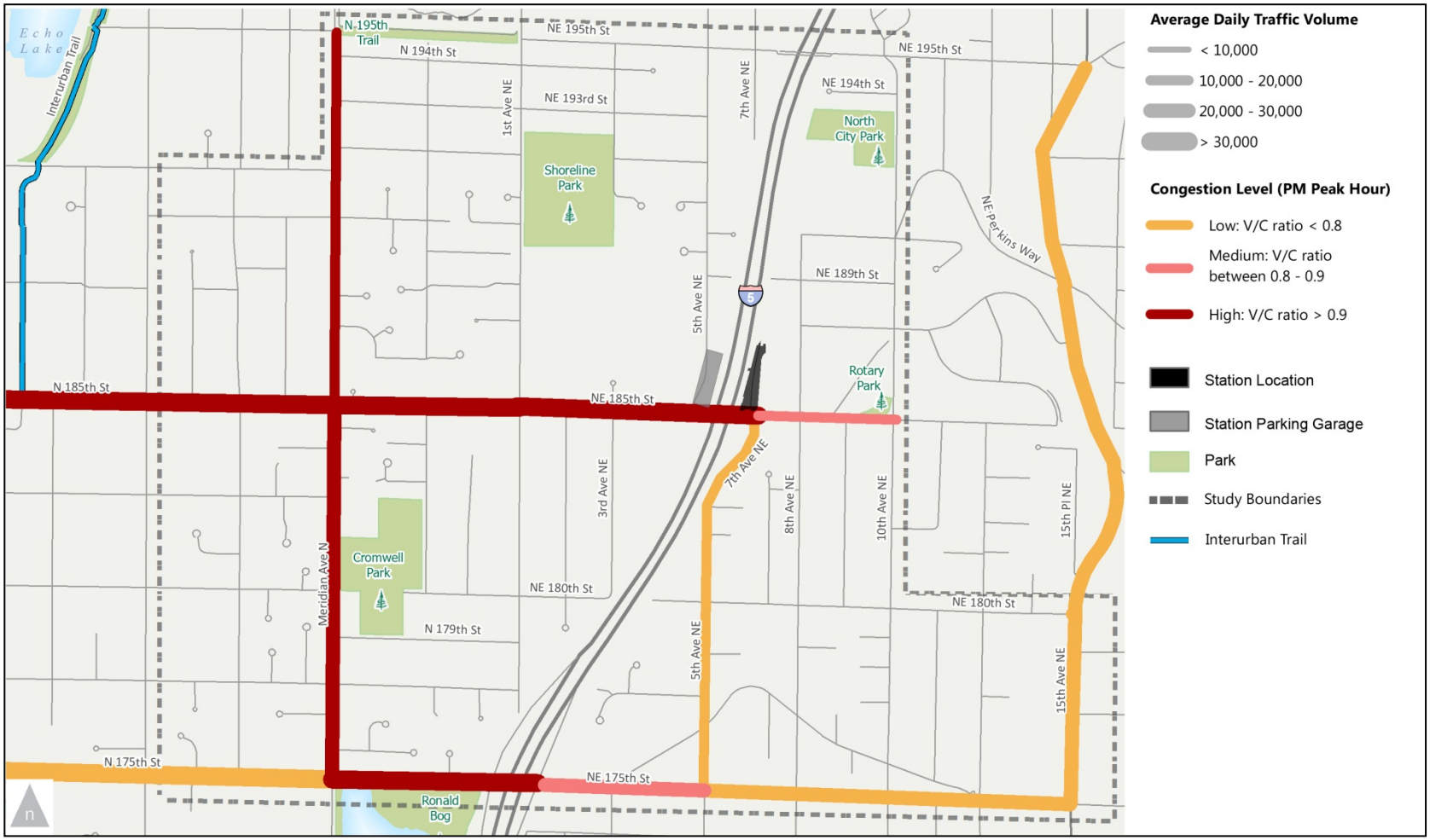


Table 3.3-8 Average Daily Traffic Volumes and PM Peak Period Congestion for Alternative 3—Previous Most Growth

Street	Segment	Existing ADT	No Action ADT	Previous Most Growth ADT	Previous Most Growth PM Peak Hour Volume[11]	Previous Most Growth V/C
East-West Corridors						
175th Street	West of I-5	30,770	39,490	49,340	1,871	**>1.0**
175th Street	East of I-5	18,010	21,180	28,440	1,275	0.82
185th Street	West of I-5	9,700	17,180	34,030	1,748	**>1.0**
185th Street	East of I-5	7,130	11,360	16,240	890	**.90**
North-South Corridors						
5th Avenue NE	South of N 185th Street	3,360	5,700	10,070	532	0.76
15th Avenue NE	North of N 175th Street	15,040	20,340	21,950	1,481	0.78
Meridian Avenue N	North of N 175th Street	12,070	15,140	23,800	1,377	**>1.0**

[11] One-directional volume only, signifying the direction with the highest volume

Figure 3.3-11 Average Daily Traffic and PM Peak Congestion
Alternative 3—Previous Most Growth



Alternative 2—Some Growth

Street Access and Circulation

Changes in land use zoning, parcel consolidation and redevelopment would allow for the creation of new streets and paths along with the consolidation of access points to N-NE 185th Street. While the Shoreline Center site could provide additional alley or side street connections through the site to 3rd Avenue NE or NE 190th Street, the area would still be constrained by I-5, with east-west connections limited to N-NE 175th Street, N-NE 185th Street, and N-NE 195th Street (pedestrian/bicycle only).

Collector Arterials (such as 1st Avenue NE, 5th Avenue NE north of 185th Street, NE 180th Street, and Perkins Way) are not subject to the City's concurrency standard. While it is not anticipated that Perkins Way would see substantial traffic resulting from new development within the station area, other Collector Arterials in the subarea may. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification to Minor Arterials.

Traffic Volumes

Under Alternative 2—Some Growth, with full build-out of the proposed zoning, many intersections would fail to meet the City's standard, operating at LOS E or F as shown in **Figure 3.3-16** and **Table 3.3-9**. Intersections along N-NE 185th and N-NE 175th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under Alternative 2—Some Growth. At this time, it has not been determined how many of these land uses would be accessed directly off of N-NE 185th and N-NE 175th versus from minor streets (such as 1st Avenue NE and 5th Avenue NE) or alleyways. Provision of internal circulation routes, which consolidate access, would potentially lessen intersection and roadway impacts. The improvements needed to mitigate these impacts are described later in this document.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in trips generated within the subarea would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-10** and **Figure 3.3-17**. Meridian Avenue N, 5th Avenue NE, and N-NE 185th Street would experience the largest percentage change, with growth of between 75 and 160 percent as compared to existing conditions, while the growth along N 175th Street would be between 30 and 50 percent. V/C ratios for many of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total VMT generated from land uses within the subarea under Alternative 2—Some Growth would amount to roughly 340,000 miles per day. In total, future land use would generate roughly 211 metric tons of CO_2 per day. In comparison, Alternative 1--No Action would generate approximately 1,110,000 daily VMT and 640 metric tons of CO_2 per day based on existing land use patterns and the anticipated amount of driving.

Transit Service and Mobility

The higher density provided under Alternative 2—Some Growth would support more robust public transit service within the subarea. The TMP recommends that frequency of service could be improved to enable more frequent connections to the proposed light rail station. Based on the location of development forecast under Alternative 2—Some Growth, new service along 10th Avenue NE or 1st Avenue NE may be needed to accommodate demand generated from increased development. The growth in vehicle traffic could impact overall transit speed and reliability along N-NE 185th Street, Meridian Avenue N, and N-NE 175th Street if no transit priority treatments are provided.

Parking Conditions

For Alternative 2—Some Growth, peak parking demand is expected to be approximately 13,000 spaces more than Alternative 1—No Action (a total of 18,500) in the subarea with a higher concentration near retail-uses. This amount is a 13 percent reduction from unadjusted demand due to the potential for shared parking between complementary uses. The current zoning code allows for a reduction of up to 25 percent required spaces if there is a shared parking agreement with adjoining parcels or if high-capacity transit service is available within a one-half-mile walk shed, conditions that future development would meet under Alternative 2—Some Growth. Based on existing and future supply provided by new development at current rates specified in the zoning code, approximately 21,000 spaces would exist within the subarea.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed with new development. City code stipulates that any multifamily residential uses must have a minimum of one short-term bicycle parking space per ten dwelling units, and one long-term bicycle parking space per studio or one-bedroom unit, and two per unit having two or more bedrooms. Commercial development must have one short-term bicycle stall per twelve vehicle parking spaces and one long-term space per 25,000 square feet of commercial floor area.

Conditions for development could be structured to allow for the creation of non-motorized paths within larger parcels to connect with other on- and off-street pedestrian and bicycle facilities. Similar to Alternative 1—No Action, the increase in vehicle traffic along N-NE 185th Street and Meridian Avenue N over time will impact bicycle stress along these streets; more separated facilities may be required.

Table 3.3-9 PM Peak Period Intersection Level of Service for Alternative 2—Some Growth

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Previous Most Growth LOS	Previous Most Growth Delay (sec. / veh.)
Signalized	**185th St / Meridian Ave**	D	54	D	45	**F**	**>120**
Signalized	**185th St / 1st Ave**	A	<10	B	14	**E**	**76**
Unsignalized	**185th St / 5th Ave**	B	23	**F**	**>120**	**F**	**>120**
Unsignalized	**185th St / 7th Ave**	B	20	**E**	**36**	**F**	**>120**
Unsignalized	**185th St / 10th Ave**	A	11	C	21	**E**	**49**
Signalized	**15th Ave / Perkins Way**	C	21	D	53	D	39
Unsignalized	**180th St / 10th Ave**	A	<10	C	20	**F**	**56**
Signalized	**180th St / 15th Ave**	A	<10	C	22	C	29
Signalized	**175th St / Meridian Ave**	D	51	D	54	**E**	**67**
Signalized	**175th St / I-5 SB Ramps**	C	30	**E**	**79**	**E**	**111**
Signalized	**175th St / I-5 NB Ramps**	D	45	**F**	**>120**	**F**	**>120**
Signalized	**175th St / 5th Ave**	C	25	C	26	C	29
Signalized	**175th St / 10th Ave**	A	<10	B	16	C	23
Signalized	**175th St / 15th Ave**	D	47	D	53	D	55

Note: bold numbers signify intersections that would fall below the City's LOS standard.

Figure 3.3-16 Intersection Level of Service (Alternative 2—Some Growth)

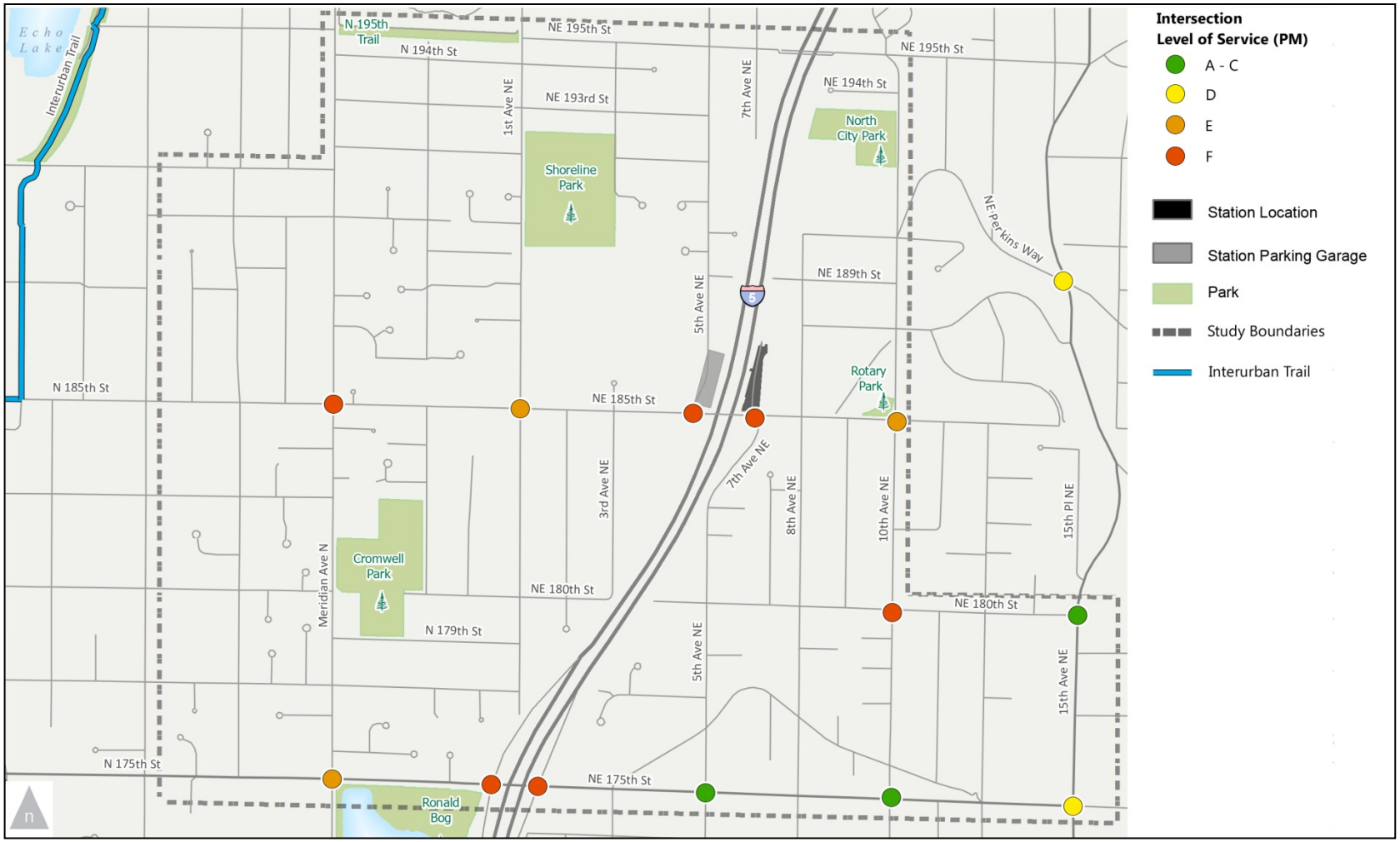
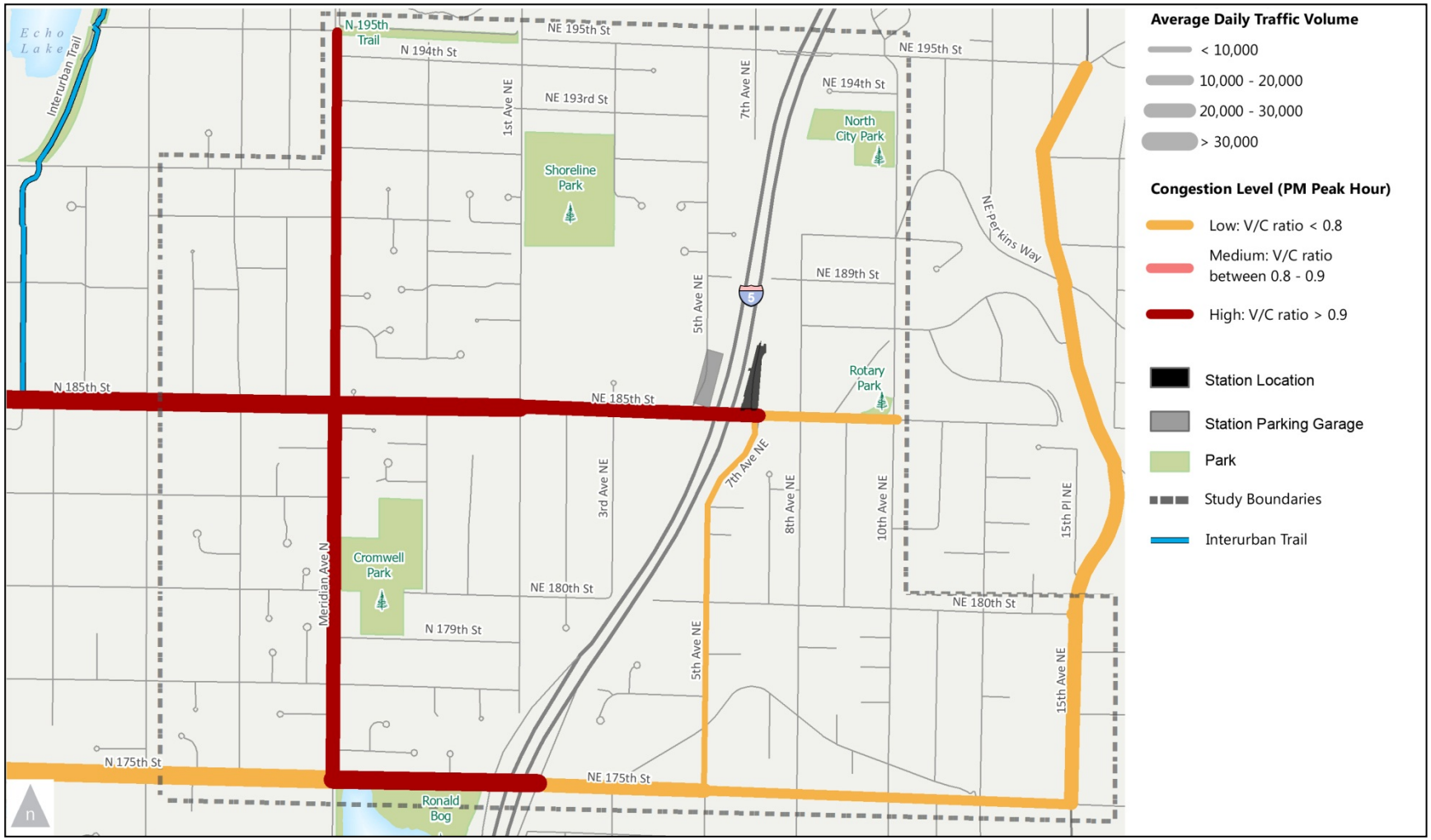


Table 3.3-10 Average Daily Traffic Volumes and PM Peak Period Congestion for Alternative 2—Some Growth

Street	Segment	Existing ADT	No Action ADT	Some Growth ADT	Some Growth PM Peak Hour Volume[12]	Some Growth V/C
East-West Corridors						
175th Street	West of I-5	30,770	39,490	46,850	1,842	**>1.0**
175th Street	East of I-5	18,010	21,180	23,970	1,009	0.65
185th Street	West of I-5	9,700	17,180	24,800	1,241	**>1.0**
185th Street	East of I-5	7,130	11,360	13,700	719	0.74
North-South Corridors						
5th Avenue NE	South of N 185th Street	3,360	5,700	6,380	292	0.40
15th Avenue NE	North of N 175th Street	15,040	20,340	20,990	1,435	0.75
Meridian Avenue N	North of N 175th Street	12,070	15,140	21,270	1,302	**>1.0**

[12] One-directional volume only, signifying the direction with the highest volume

Figure 3.3-12 Average Daily Traffic and PM Peak Congestion for Alternative 2—Some Growth



Alternative 1—No Action

Street Access and Circulation

With no change in land use zoning, the current street access and circulation network would remain for Alternative 1—No Action.

Traffic Impact Analysis

Under Alternative 1—No Action, some signalized intersections would fail to meet the City's LOS standard. These intersections are shown in **Figure 3.3-18** and **Table 3.3-11**. The intersections along N 175th Street would experience the greatest increase in delay as a result of growth in overall traffic volumes. Delays at the intersection of 7th Avenue NE and NE 185th Street, 5th Avenue NE, and NE 185th Street are also expected to exceed the City's standard due to their configuration (side-street stop control) and demands from the northbound left-turn movement from 7th Avenue NE, and the southbound left-turn movement from 5th Avenue NE. Those intersections may require signalization depending on actual traffic volumes once the station is in place.

Average Daily Traffic Volumes on Major Corridors

As shown in **Table 3.3-12**, average daily traffic volumes and congestion under Alternative 1—No Action are expected to grow along major roadway segments compared to today. **Figure 3.3-19** shows expected traffic volumes on roadways and the projected V/C ratios on principal and minor arterials within the subarea. The segment of Meridian Avenue N between N 175th Street and N 185th Street would operate at a V/C ratio of .94, while N-NE 175th Street between I-5 and Meridian Avenue N would have a V/C ratio of .97. Both of these segments would have congestion levels above the City's adopted threshold of .90.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total vehicle-miles-traveled (VMT) generated from development within the subarea would amount to roughly 170,000 miles per day. This is based on a continuation of existing land-use patterns and current zoning. The suburban nature of development constrains the amount of trips that can be completed via non-auto modes such as walking, bicycling, or transit because of the long distances between origins and destinations. In total, future land uses within the subarea would generate roughly 150 metric tons of carbon dioxide (CO_2) per day from additional transportation demand. In comparison, a similar amount of housing and retail with a density proposed in the Some Growth Alternative would generate approximately 35,000 fewer daily VMT and 100 fewer metric tons of CO_2 per day.

Transit Service and Mobility

Under the Alternative 1—No Action, transit service would likely remain at current levels, as the existing land uses and densities would not support increases in transit service frequency. While the future light rail station would provide regional mobility, local bus service would primarily function to transport passengers to and from outside of the station subarea. The increased traffic along N 185th Street and Meridian Avenue N may have an impact on overall transit reliability without any mitigating measures, such as transit signal priority or other intersection treatments.

Parking Conditions

Based on current supply and the expected limited growth in demand in the subarea, parking conditions would remain similar to existing conditions. Peak demand is forecast to be

approximately 6,000 spaces for the entire area. The parking minimums articulated in City code specify that any new development of single-family residential uses would be built with two spaces per unit. Any new development in retail or other commercial-related land use would require one space per 300 to 400 feet of leasable space. With little opportunity for development of complementary uses, the amount of parking that could be shared would be limited.

Pedestrian and Bicycle Mobility

Under the Alternative 1—No Action, the pedestrian and bicycle environment would improve with the planned improvements specified in the TMP.

Bicyclists traveling from the Interurban Trail could utilize low stress routes via 1st Avenue NE and 5th Avenue NE in order to connect to the station. However, increased traffic volumes along N-NE 185th Street may justify a more separated facility such as a cycle track. Additionally, with higher traffic volumes projected along Perkins Way, NE 180th Street, and 10th Avenue NE, the bicycling stress may increase without facilities that accommodate bicycles.

Table 3.3-11 PM Peak Period Intersection Level of Service for Alternative 1—No Action

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)
Signalized	185th St / Meridian Ave	D	54	D	45
Signalized	185th St / 1st Ave	A	<10	B	14
Unsignalized	185th St / 5th Ave	B	**23**	**F**	**>120**
Unsignalized	185th St / 7th Ave	B	**20**	**E**	**36**
Unsignalized	185th St / 10th Ave	A	11	C	21
Signalized	15th Ave / Perkins Way	C	21	D	53
Unsignalized	180th St / 10th Ave	A	<10	C	20
Signalized	180th St / 15th Ave	A	<10	C	22
Signalized	175th St / Meridian Ave	D	51	D	54
Signalized	175th St / I-5 SB Ramps	C	**30**	**E**	**79**
Signalized	175th St / I-5 NB Ramps	D	**45**	**F**	**>120**
Signalized	175th St / 5th Ave	C	25	C	26
Signalized	175th St / 10th Ave	A	<10	B	16
Signalized	175th St / 15th Ave	D	47	D	53

Note: bold numbers signify intersections that would fall below the City's LOS standard.

Figure 3.3-13 Intersection Level of Service for Alternative 1—No Action

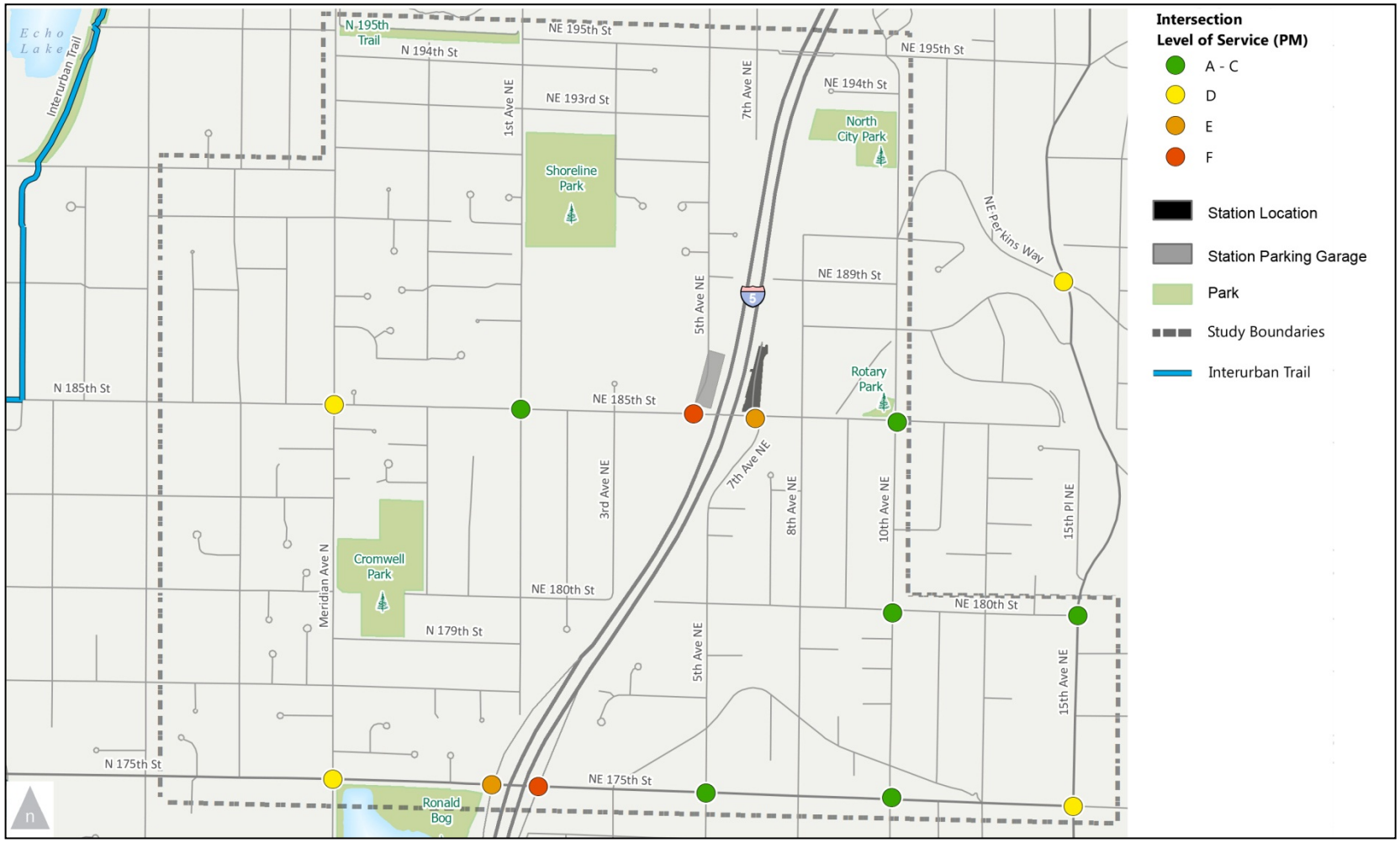
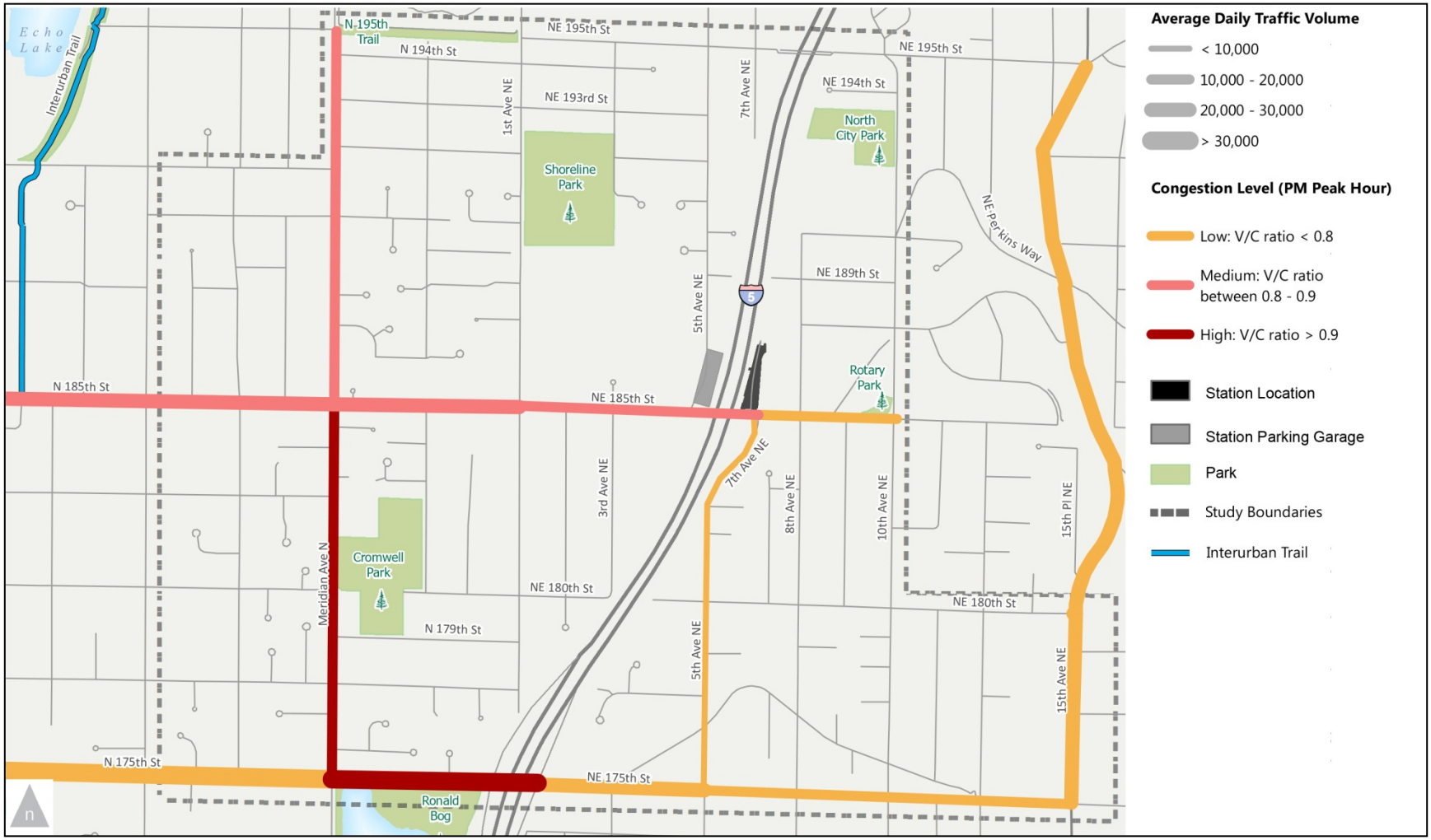


Table 3.3-12 Average Daily Traffic Volumes and PM Peak Period Congestion for Alternative 1—No Action

Street	Segment	Existing ADT	No Action 2035 ADT	No Action PM Peak Hour Volume[13]	No Action V/C Ratio
East-West Corridors					
175th Street	West of I-5	30,770	39,490	1,515	**0.97**
175th Street	East of I-5	18,010	21,180	922	0.59
185th Street	West of I-5	9,700	17,180	896	0.89
185th Street	East of I-5	7,130	11,360	646	0.65
North-South Corridors					
5th Avenue NE	South of NE 185th Street	3,360	5,700	244	0.35
15th Avenue NE	North of NE 175th Street	15,040	20,340	1,403	0.76
Meridian Avenue N	North of N 175th Street	12,070	15,140	920	**0.94**

[13] One-directional volume only, signifying the direction with the highest volume

Figure 3.3-19 Average Daily Traffic and PM Peak Congestion for Alternative 1—No Action



3.3.3 Mitigation Measures

Introduction

This section describes the mitigation measures that would be needed to address impacts under each of the future alternatives. It is important to note that the land use changes proposed and the traffic impacts identified in the previous section are based upon full build-out scenarios for each alternative. While this build-out would occur over a long period of time and would not be fully implemented for any of the alternatives by 2035, the mitigation measures proposed below identify the full scale of actions needed. In reality, these measures would gradually be incorporated as development occurs and would be continually monitored to address the most current conditions. A later section will highlight the near-term projects needed based on a 2035 scenario for any of the action alternatives.

Applicable Regulations and Commitments

The Shoreline Municipal Code (SMC) contains a number of regulations and stipulations that would apply to all future alternatives. Under Chapter 14.10, the City of Shoreline currently manages a Commute Trip Reduction program that assists employers of a certain size to reduce their overall VMT and automobile trips.

This program should continue with new employers in the area to leverage the availability of high capacity transit and reduce the net increase in automobile trips.

Additionally, Chapter 20.50 in the Shoreline Municipal Code contains a number of stipulations for new development that aim to improve pedestrian and bicycle facilities while also reducing the amount of parking provided.

In July 2014, the City Council adopted Shoreline's first Transportation Impact Fees (TIFs). TIFs are charged during the building permitting process and used to fund projects to maintain or improve levels of service on Shoreline's streets. The intent is to share the financial responsibility of providing transportation facilities, such as roads and intersections that support future growth with the development that grows the city's population and economy.

As of January 1, 2015, all projects that add trips to City streets are required to pay the impact fee. This includes accessory dwelling units (ADUs or Mother in Law apartments) or any project that creates space for extra 'trip' generating residents or uses on a property. The fee is proportionate to the size of the development or change in use. There are a number of exemptions, including for affordable housing.

Mitigation Measures for Street and Intersection Impacts

With full build-out, the level of planned development would be substantial under Alternative 4—Preferred Alternative and Alternative 3—Previous Most Growth, and while less substantial under Alternative 2—Some Growth, implementation of any of the action alternatives would require substantial multimodal transportation investments to mitigate the impacts. Additional mitigation measures likely also would be needed for Alternative 1—No Action to maintain the City's current LOS standards in 2035.

It is estimated that Alternative 4 – Preferred Alternative would take 80 to 125 years or more to reach build-out of the proposed zoning capacity. Alternative 3—Previous Most Growth could take 60 to 100 years or more and Alternative 2—Some Growth would take 30 to 50 years or more to reach build-out.

Multimodal transportation improvements required to support the growth of any of the alternatives could be funded incrementally through a variety of sources, including federal and state grants, and cycles of capital improvement plans. The length of time to build-out would enable the City to monitor growth and proactively plan for needed improvements over time. The City also intends to pursue a variety of transportation demand management strategies to mitigate and minimize traffic congestion and reduce vehicle miles traveled, consistent with the Climate Action Plan and other City plans and policies.

N-NE 185th Street will be a major conveyor for all modes to get to and from the station. A conceptual design has been developed that would, if implemented, enhance connectivity in the corridor. The improvements conceptualized would improve mobility for pedestrians, bicyclists, and transit services, as well as automobile traffic. The concept envisions a raised cycle track that would separate bicyclists from transit, as well as generous sidewalk widths. Three lanes would be provided for traffic and transit (one westbound, one eastbound, and a center turn lane). **Figure 3.3-20** and **Figure 3.3-21** illustrate this conceptual design.

If current travel patterns continue, the build-out of Alternative 2—Some Growth (30 to 50 years from now or more) may necessitate widening of N-NE 185th Street beyond three lanes from Aurora Avenue N to 5th Avenue NE. Similarly, with full build-out of Alternative 3—Previous Most Growth and Alternative 4 – Preferred Alternative (60 to 100 years from now or more) the full length of the corridor may need to be widened. However, in the coming years the City would pursue a full range of options to minimize traffic congestion on N-NE 185th Street to avoid the need to widen the street for as long as possible. For example, new development sites along the corridor likely would be required to have access from the side streets and/or rear alleyways and not directly onto N-NE 185th Street. This would reduce the amount of traffic that directly impacts the N-NE 185th Street corridor. Access management (reduced curb cuts/driveways), as well as a new system of well-connected blocks, road connections, non-motorized facilities, and alleyways would serve corridor development, taking pressure off N-NE 185th Street. This would improve overall travel flow for all modes and enhance pedestrian and bicyclist safety.

The City intends to work with transit providers to increase connectivity to and from the station. The City is also interested in exploring bike station programs and other actions.

Many of the projects identified as mitigation for the alternatives would require additional street right-of-way near the intersection locations, and if N-NE 185th Street had to be widened in the long term future, additional easements or right-of-way would need to be obtained. These could be determined through a corridor development plan, which would need to be completed following adoption of the subarea plan. As a means to reduce the amount of infrastructure necessary to accommodate future growth, the City may look to revise its concurrency standards to allow for LOS E in certain situations. Also, behavioral change and new technologies (such as driverless cars) may increase road capacity, making future expansion of 185th beyond three lanes unnecessary.

Figure 3.3-14 Conceptual Cross Section for N-NE 185th Street

Figure 3.3-15 Perspective View of N-NE 185th Street Concept

Mitigation Measures for Each Alternative

In addition to the roadway improvements called out in the TMP[14], the following measures are recommended for the alternatives analyzed in this FEIS.

Alternative 4—Preferred Alternative (Build-Out) and Alternative 3—Previous Most Growth (Build-Out)

Mitigation measures for Alternative 4—Preferred Alternative and Alternative 3—Previous Most Growth are the same given that these would generate similar levels of traffic at full build-out.

General Street and Intersection Improvement Mitigation Measures

- Additional through-lanes along N-NE 185th Street from 10th Avenue NE to Aurora Avenue N
- Additional right-turn pockets for the eastbound and westbound approaches along N 185th Street at the intersection with Meridian Avenue N
- Additional through-lanes in the northbound and southbound direction along Meridian Avenue N between N 175th Street and N 205th Street with a right-turn pocket on the northbound approach to N 185th Street
- Dual left-turn pockets for the southbound approach at 1st Avenue NE and NE 185th Street
- Right-turn pocket for the westbound approach at 5th Avenue NE and NE 185th Street
- Two-way left-turn lane along 5th Avenue NE between NE 175th Street and NE 185th Street
- Dual left-turn pocket for eastbound approach at 15th Avenue NE and NE 175th Street
- Northbound right-turn lane at N 175th Street and Meridian Avenue N
- Signalization of the following intersections:
    - NE 185th Street and 5th Avenue NE
    - NE 185th Street and 7th Avenue NE
    - NE 185th Street and 10th Avenue NE
- Signalization or roundabout conversion of the following intersection:
    - NE 180th Street and 10th Avenue NE
- Widening of the intersection of 5th Avenue NE and NE 175th Street to facilitate bus turns from EB NE 175th St to NB 5th Avenue NE. Only smaller buses can make the turn today
- NE 175th Street and the I-5 Ramps are within WSDOT jurisdiction and would require additional mitigation

In addition to the above projects, which were based on the City's LOS standards, the City should engage as needed in traffic calming measures along non-arterial streets to prevent cut-

[14] For example, where the TMP recommends a center-turn lane along Meridian Avenue, that profile is assumed in addition to the recommended improvements stated in this section.

through traffic both to the light rail station and new development sites. The City of Shoreline has a Neighborhood Traffic Safety Program to help address the safety concerns on residential streets stemming from higher speed and/or cut-through traffic. This program includes enhanced enforcement and education, along with engineering solutions such as traffic circles, speed humps, and narrowed lanes. Solutions to address traffic issues are discussed and implemented as part of a public process to ensure they appropriately address a given circumstance.

Transit Service Mitigation Measures

For all alternatives, at least 22 buses are expected to serve the future light rail station during the PM peak hour, or roughly one bus every three minutes. Depending on final design of the station, ample bus pull-out and layover space should be provided to maintain operations efficiency and prevent spillover impacts to the roadway network.

The City of Shoreline should continue coordinating with area transit agencies in the development of a Transit Service Integration Plan (TSIP) for the light rail station subarea. This coordination should coincide with traffic analysis to ensure transit service reliability along the major corridors in the area. Transit reliability can be improved via a number of transit priority treatments including signal priority, bus bulbs, and bus queue jump lanes. These measures should be evaluated as part of the TSIP. Additionally, on-demand transport such as the King County Metro Access and the Hyde Shuttles should have direct service to the light rail station bus access point in order to improve service for those with mobility limitations.

Additional modes that could operate in coordination with transit include bike sharing or car sharing programs, with organizations such as Zipcar, Car2Go, or Puget Sound Bike Share ("Pronto"). An analysis of potential demand for these services should be conducted to determine their relative feasibility.

Parking Mitigation Measures

While any new development is required by City code to provide ample off-street parking for the demand generated by its respective use, there are options to reduce the overall amount of parking supply created. City code stipulates that development may reduce its parking supply requirement by up to 25 percent by using a combination of the following criteria:

- Shared parking agreement with adjoining parcels and land uses that do not have conflicting parking demands
- High-occupancy vehicle (HOV) and hybrid or electric vehicle (EV) parking
- Conduit for future electric vehicle charging spaces, per National Electrical Code, equivalent to the number of required disabled parking spaces
- High-capacity transit service available within a one-half mile radius
- Concurrence with King County Right Size Parking data, census tract data, and other parking demand analysis results

While the Preferred Alternative has more development and higher trip generation than other alternatives, it also provides greater opportunity to take advantage of these code provisions. Alternative 1—No Action by contrast lends itself to more auto-oriented development that is not as conducive to measures like

shared parking. Besides mitigating parking demand generated from new development, any on-street parking spillover generated from the proposed land uses or the light rail station may be mitigated via a Residential Parking Zone (RPZ) designation. An RPZ provides on-street parking permits to residents located within the zone to help discourage long-term parking by non-residents on non-arterial streets. An evaluation of parking demand in the area as it redevelops following implementation of light rail service should be conducted on an annual basis to assess the need of an RPZ designation. Additional measures that may be taken to address parking impacts include:

- Install signage and driver information to direct commercial and light rail users towards available off-street parking garage locations near commercial development
- Implement variable parking time limits and prices to moderate parking demand and ensure sufficient supply during peak parking periods
- Evaluate the provision of additional off-street parking supply near commercial areas

Pedestrian and Bicycle Facilities Mitigation Measures

Additional traffic along N-NE 185th Street along with increased bus service will create a higher potential for conflicts between bicyclists, pedestrians, transit vehicles, and automobiles. One possible measure to properly accommodate all modes could be a cycle track from the Interurban Trail to 10th Avenue NE. A facility of this nature would allow for a safe non-motorized connection via the key N-NE 185th Street corridor while separating bicycles from vehicles and pedestrians. The Preferred Alternative could improve overall pedestrian and bicycle connectivity by allowing for more dedicated pathways with parcel consolidation and expanded development. Any new development in the area under the proposed zoning should consider pedestrian and bicycle paths through the sites to allow for connections to the station and subarea amenities without the need to travel along busy arterials.

A dedicated path along the I-5 right-of-way near the proposed light rail alignment could provide a connection between the station and the pedestrian and bicycle bridge at NE 195th Street, and would provide a connection to the regional trails such as the Interurban Trail and the Burke-Gilman Trail. Additionally, bicyclists from Lake Forest Park and areas to the northeast and east of the subarea may utilize Perkins Way as an access route to the station.

While the City is currently upgrading Perkins Way with bicycle signage as part of the Interurban and Burke-Gilman Connector project, a more separated facility to accommodate bikes may be needed. Conversely, traffic volumes from new development along 10th Avenue NE may necessitate the installation of bicycle lanes to provide a safer bicycling environment.

The City is interested in exploring opportunities for bicycle sharing and bicycle storage facilities near the station to encourage and enhance bike access to transit. This likely would encourage more use of the N-NE 185th Street/10th Avenue NE/NE 180th Street corridor as a bicycle connection to and from the station.

The First Twenty Years (Up to 2035) for Any Action Alternative

As stated in previous sections, the length of time until full build-out of any action alternative would enable the City to monitor growth and proactively plan for needed improvements. This should occur as development proceeds in order to provide a sustainable and efficient transportation system within the subarea.

In the meantime, the next twenty years will bring an important focus on funding and implementing projects to support anticipated growth through 2035. This section details specific actions the City can take to address growth that is forecast for 2035.

N-NE 185th Street

The main corridor within the subarea is also the primary connection to the station and will most likely experience the largest amount of trip growth. Current daily volumes of up to 9,700 along the corridor are far below capacity and do not necessitate any infrastructure improvements beyond what has already been identified in the Shoreline Transportation Master Plan and the Lynnwood Link Extension Preferred Alternative. Based on forecast volumes, N-NE 185th Street may carry up to 20,000 vehicles per day; approaching the theoretical capacity of the corridor. Beyond what has already been identified in the TMP, the City should take the following actions as appropriate during the 20-year horizon to properly manage changes in travel patterns along this corridor.

- Travel demand management strategies to reduce overall vehicle trips along the corridor. This includes continued expansion of the bicycle and pedestrian network along with transit service priority measures
- Continue to monitor traffic volumes on a bi-annual basis to identify changes in congestion patterns
- Employ access management strategies for new development to reduce the number of curb cuts and access points along N-NE 185th Street
- Expand signal coordination and other Intelligent Transportation Systems (ITS) strategies.
- Consistent with the TMP, reconfigure the intersection of N 185th Street and Meridian Avenue N
- Provide protected/permitted phasing for northbound and southbound left-turn movements at N 185th Street and Meridian Avenue N
- Signalization of the intersections along N-NE 185th Street at 5th avenue NE and 7th Avenue NE may be necessary depending on actual station and parking garage-access volumes with implementation of light rail service in 2023
- As traffic volumes approach the capacity of N-NE 185th Street, evaluate adding lane capacity from Aurora Avenue N to 7th Avenue NE.

Parking Management Strategies

Monitoring and managing parking issues in the subarea should be an important focus of the first twenty years of implementation. As demand for parking shifts with the light rail service and changes in development, the City has a number of parking

management strategies that are common elements in Transit-Oriented Development.

- *Residential Parking Zones (RPZ)* – Implementation of an RPZ would help discourage long-term parking within residential areas by retail or light rail station users.
- *Time limits and restrictions* – Time limits can help limit parking spillover into residential areas and can also improve parking turnover in commercial areas.
- *Parking location signage* – Information directing drivers to available off-street parking locations can improve vehicle circulation and ensure that parking supply is utilized.
- *Variable parking pricing* – Changes in parking rates based on time period and demand can help moderate available supply.
- *Additional off-street parking supply*- If existing parking facilities are being efficiently used, then the City or property owners may consider adding off-street parking to ease the pressure off of on-street supply.

Transit Service Improvements

Transit service integration and improvements will be an important priority after the light rail station is operating. As part of the TSIP currently under development, the City should specifically focus on the N-NE 185th Street/10th Avenue/180th Street corridor to ensure transit vehicles can operate efficiently through the subarea. Strategies the City may employ include the construction of signal priority systems, queue jumps, and bus bulbs. Specifically, these solutions should target potential chokepoints along N-NE 185th Street, such as Meridian Avenue N and/or 5st Avenue NE. Additionally the plan should evaluate the potential signalization of NE 185th Street and 7th Avenue NE to allow for efficient access of busses into and out of the light rail station.

Pedestrian and Bicycle Facilities Mitigation Measures

The mitigation measures listed for Alternative 4—Preferred Alternative (Build-Out) should all be an important focus of the first twenty years of implementation. Refer to the measures listed on pages 3-156 and 3-158.

Alternative 2—Some Growth

- Transportation demand strategies and actions to minimize traffic congestion on N-NE 185th Street, Meridian Avenue N, and other key corridors in the subarea
- Additional through-lanes in the eastbound and westbound direction along NE 185th Street from Aurora Avenue to 5th Avenue NE could be needed to support full build-out of this alternative, if other mitigation measures are unsuccessful in controlling traffic levels
- Additional through-lanes in the northbound and southbound direction along Meridian Avenue N between N 175th Street and N 205th Street if transportation demand strategies are unsuccessful
- Right-turn lane for westbound approach at N 175th Street and Meridian Avenue N
- Right-turn lane for the northbound approach at N 175th Street and Meridian Avenue N
- Signalization of the following intersections:
  - NE 185th Street and 5th Avenue NE
  - NE 185th Street and 7th Avenue NE
- Signalization or roundabout conversion of the following intersections:
  - NE 185th Street and 10th Avenue NE
  - NE 180th Street and 10th Avenue NE
- Widening of the intersection of 5th Avenue NE and NE 175th Street to facilitate bus turns from EB NE 175th Street to NB 5th Avenue NE. Only smaller buses can make the turn today.
- NE 175th Street and the I-5 Ramps are within WSDOT jurisdiction and would require additional mitigation

N-NE 175th Street

- Consistent with the TMP, reconfigure the intersection of N 175th Street and Meridian Avenue N
- NE 175th Street and the I-5 Ramps are within WSDOT jurisdiction and may require additional mitigation

1st Avenue NE

- Consistent with the TMP, add bicycle lanes along 1st Avenue NE from the 195th Street trail to NE 185th Street

5th Avenues NE

- Consistent with the TMP, reconstruct 5th/7th Avenue NE with full sidewalk coverage and bicycle lane provision from NE 175th Street NE to NE 185th Street, and 5th Avenue NE from NE 185th Street to NE 195th Street.

Meridian Avenue N

- Continue to monitor traffic volumes on a bi-annual basis to identify changes in congestion patterns
- Consistent with the TMP, convert Meridian Avenue N to a three-lane profile with a two-way left-turn lane and bicycle lanes

10th Avenue NE

- Consistent with the TMP, install sidewalks on both sides of the street from NE 175th Street to NE 195th Street

NE 180th Street

- Consistent with the TMP, install sidewalks on both sides of the street from 15th Avenue NE to 10th Avenue NE

Perkins Way

- While future traffic volumes for Perkins Way are forecast to be within the capacity of the roadway, the City should continue to evaluate bicycle facilities to improve connections from northeast of the station.

Potential I-5 Non-Motorized Trail

- Work with Sound Transit to identify potential locations for a non-motorized trail along the right-of-way secured for the light rail alignment on the east side of I-5. This trail would provide a dedicated north-south connection from the NE 195th Street pedestrian and bicycle bridge to the station.

Alternative 1—No Action

- Timing adjustment and phase changes for northbound and southbound movements at N 175th Street and Meridian Avenue N
- NE 175th Street and the I-5 Ramps are within WSDOT jurisdiction and would require additional mitigation

3.3.4 Significant Unavoidable Adverse Impacts

Under all alternatives, the subarea would be anticipated to experience growth in traffic levels. Given that growth is expected to occur incrementally over many decades, the City and other agencies responsible for transportation services would be able to proactively monitor changes, update plans, and implement needed improvements to address the increased transportation demand. Behavioral changes in the way people travel (such as reduced vehicle household trips in a more walkable neighborhood, use of bike share and car share programs, and increased use of the high-capacity transit system) also would help to offset some of the demand over time. Given these considerations and with implementation of mitigation measures, no significant unavoidable adverse impacts would be anticipated.

3.4 Public Services

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures for public services, including public school services and facilities; parks, recreation, and open space; police, fire, and emergency services; solid waste management; and other public services and facilities. Public facilities and community facilities within the subarea and vicinity are illustrated on **Figure 3.4-1**.

This section is organized slightly differently from other sections in this chapter for better flow and readability of the subject matter. Affected Environment, Analysis of Potential Impacts, and Mitigation Measures are discussed under each public service topic area, beginning with Public School Services and Facilities below.

3.4.1 Public School Services and Facilities

Affected Environment

Shoreline Public School District Number 412 provides kindergarten through twelfth grade (K-12) public education services for the cities of Shoreline and Lake Forest Park. The school district is known as one of the best in the region, and as such, these communities are known for having good schools and being desirable places to live for families with school children. Goals in Shoreline's Comprehensive Plan highlight the community's commitment to continue to support exceptional schools and opportunities for lifelong learning, as well as to strengthen partnerships with schools and volunteers.

The school district encompasses a 16 square mile area, bounded by Puget Sound on the west, Lake Washington to the east, the Seattle city limits to the south of 145th Street, and the King/Snohomish County line to the north. The school district operates 16 public schools, a transportation center, and the Shoreline Center. Many of these facilities are located in proximity to the subarea (either located within the subarea boundaries or within less than a mile of these boundaries). Residents of Shoreline are served by all district schools, except Brookside Elementary School and Lake Forest Park Elementary School.

The school district operates seven elementary schools, two middle schools, two high schools, the Shoreline Center (see more detail, next page), a public preschool facility, and two additional surplus properties located within the city. In addition to these facilities, the school district maintains a transportation center (also known as the bus barn) located adjacent to the Ridgecrest Elementary School site, and a warehouse with a central kitchen located adjacent to Hamlin Park. The Shoreline Center and the old North City Elementary School sites are located within the subarea and the schools that serve the subarea, as well as the overall district are discussed later in this section.

Shoreline Center

The Shoreline Center was once the location of Shoreline High School. Located just west of the I-5 corridor and north of N185th Street, Shoreline Center is now the home of the central offices of the school district, as well as offices for several local non-profit agencies, conference center facilities, and cultural and recreation services and facilities.

The Shoreline Center building accommodates a wide variety of public, non-profit, and private uses, including:

- Northshore/Shoreline Community Network
- Office space for Washington State Legislature Representative Cindy Ryu and Representative Ruth Kagi (32nd District)
- Office space for Washington State Senator Maralyn Chase (32nd District)
- Shoreline Chamber of Commerce
- Shoreline-Lake Forest Park Senior Services Center
- Shoreline-Lake Forest Park Arts Council
- Shoreline Schools Foundation
- The Norwest School of Horology
- Washington Alliance for Better Schools (WABS)

In addition, the school district maintains facility use agreements with entities that regularly use space at the Shoreline Center such as the University of Phoenix, Weight Watchers, Rotary Clubs, conference center users, and others.

The Conference Center hosts a wide variety of events from small meetings and workshops to large conferences and conventions, and social gatherings such as community banquets and wedding receptions. One of the ten largest event venues in the Seattle area, the Conference Center's hallways serve as a gallery for art work created by students of the Shoreline School District, enjoyed by hundreds of thousands of visitors each year. Works by local professional artisans are also displayed in the on-site gallery of the Shoreline- Lake Forest Park Arts Council.

Shoreline Center's forty-acre campus includes the Shoreline Stadium (a venue for local and regional school sports events), the Spartan Recreation Center (a multi-use community facility jointly owned and operated by the Shoreline School District and the City of Shoreline), and the Shoreline / Lake Forest Park Senior Center (a community support center and gathering place for senior citizens). On adjacent property to the north of the campus, the City of Shoreline operates the Shoreline Pool and Shoreline Park.

Proceeds from operations at the Shoreline Center are allocated to the general fund of the 10,000 student district.

The school district's policies call for retaining ownership of their properties over the long term as assets for potential future educational and institutional needs. The school district has no immediate plans for redevelopment of the Shoreline Center site, and there is recognition within the community that many of the current uses at the site are beneficial to the public. That said, in considering long range possibilities for this large site that will be located within walking distance of high-capacity transit, the school district is interested in analyzing potential redevelopment opportunities. They intend to proceed with independent analysis and planning to explore possible long term options.

Zoning options for the Shoreline Center site that would maximize future development potential and allow flexibility for a variety of mixed use, housing, educational, commercial, and recreational uses are proposed under Alternative 4—Preferred Alternative, as well as Alternative 2—Some Growth and Alternative 3—Previous

Most Growth. Allowable building height and form at the site would facilitate redevelopment into a variety of diverse options.

During subarea planning workshops, participants suggested that many of the existing uses at the site could be consolidated into a new, more compact multi-level building, freeing up land for new buildings and uses elsewhere on the property. Redevelopment concepts in the 185th Street Station Subarea Plan can help to inform potential options for the Shoreline Center site. Decisions related to redevelopment will be entirely up to the School District. Refer to Section 3.1 for additional information.

North City School Building and Site

While North City Elementary is no longer being operated as an elementary school, the building accommodates a variety of uses, including three cooperative preschools (North City, Shoreline, and Shorenorth, all affiliated with Shoreline Community College), one independent preschool, the Wonderland Development Center, and the school district's Home Education Exchange, a resource to homeschoolers.

There is the potential that this school and site would need to be reinstated in the future for elementary school or other education use to serve growth within the subarea.

Public Schools

Public school facilities are listed in **Table 3.4-1.** It should be noted that while this environmental analysis focuses on public services and facilities, there are several private schools located in Shoreline that also provide education services to the population.

The currently mapped school attendance areas directly affected by the subarea are Echo Lake, Meridian Park, and Ridgecrest. Echo Lake Elementary, Meridian Park Elementary, and Ridgecrest Elementary are the designated elementary schools for the subarea. Attendance at middle schools and high schools is determined by where the student resides (either east or west of Interstate 5). Students in the subarea east of Interstate 5 currently attend Kellogg Middle School and Shorecrest High School. Students in the subarea west of Interstate 5 currently attend Einstein Middle School and Shorewood High School.

For the 2012-2013 school year, district enrollment was counted at 8,714 students. Given that there are an estimated 26,600 households in the district (combining households in Shoreline and Lake Forest Park), the estimated ratio of students per household is .33 students/household. It should also be noted that of the total enrollment in schools, approximately 81 percent are generated by Shoreline households and 19 percent by Lake Forest Park households. **Table 3.4-2** shows the approximate breakdown of enrollment per high school, middle school, and elementary school.

Recently Improved and Planned School District Facilities

The school district substantially renovated its two high schools, Shorecrest and Shorewood, between 2011 and 2014 to meet standards of the Washington Sustainable Schools Protocol. In February of 2014, a special election approved replacement levies for educational programs, maintenance, and operations, and capital for technology improvements and support.

The programs, maintenance, and operations levy provides the district with approximately 26 percent of its general fund

operating revenue. It pays for the basic education programs not supported by state and federal funding, including nurses, family advocates, librarians, and instructional materials. It helps support special education, highly capable, remedial and vocational education programs, building maintenance and utilities, and transportation. Funds are also used to support extra-curricular student activities, including music, drama, and athletics.

The technology improvements and support levy is used to meet the district's ongoing technology needs for capital improvements. This includes student computers and expanded online curriculum for classroom use, instructional specialists, equipment upgrade and replacement (including lab and library computers, printers, classroom audio-visual equipment), professional development and training, server and network replacements and upgrades, administrative software systems, online and subscription resources, and virus and firewall protection.

In 2012, the school district concluded a three-year bond for construction projects. Those improvements included construction of the new Shorewood High School and Shorecrest High School, mechanical system, field and site upgrades, fire and security upgrades, traffic improvements, electronic and communications improvements, upgrades to finishes, and central kitchen upgrades.

The district anticipates that replacement levies would allow for continued stability of school tax collections for the next four years. The proposed levy amounts are unchanged from the expiring 2010 Capital Levy for Technology Improvements and Support.

In recent years, a number of elementary school sites have been converted to other uses (Aldercrest Annex and Cedarbrook, North City, and Sunset elementary school sites). The school district intends to retain these properties in case they are needed for future school use. Although the school district currently has no plans for building new schools, it is recognized that additional schools and facilities may be needed in the future to serve growth in the subarea.

Analysis of Potential Impacts

Alternative 4—Preferred Alternative

Under the Alternative 4—Preferred Alternative, population and housing growth would place increased demands on the school district for additional facilities and employees. This increased demand would be higher than under the other alternatives. The total population would be expected to rise to 56,529 people living in 23,554 households under Alternative 4—Preferred Alternative. This is 48,585 more people and 20,244 more households than under today's levels.

School enrollment trends are affected by a variety of factors, including population growth, housing availability, economic conditions, and prevailing birth rates. However, it is generally accepted that growth in population equates to a greater demand for educational services.

While most of this demand would be for public school services provided by Shoreline School District, not all the projected students would attend public schools; some would attend private schools or may be home-schooled. In addition to increased

student enrollment, population increases would create a higher demand for other types of public school services, such as preschool and extracurricular activities.

Using a factor of .33 students per household based on current enrollment in the district, approximately 16,033 students would be generated by the anticipated growth. While it is not known exactly how this student population would be assigned to various levels in the school system, based on the breakdown in current enrollment (Table 3.4-2), assumptions can be made as to the proportion of potential students per school level. This is an estimation only, as future demographics may be different from current demographics.

Applying the proportional factors per school level based on today's demographics, this would equate the following student population at build-out (based on current attendance at each school level):

- 7,891 elementary school students
- 2,439 middle school students
- 5,703 high school students.

In addition to increased student enrollment, Alternative 4 would create a higher demand for other types of public school services, such as preschool and extracurricular activities, than under the other alternatives. Full build-out under Alternative 4 would not be anticipated to occur by 2035. Based on market factors, property characteristics, and current population growth trends in Shoreline and the region, this level of growth would be anticipated to occur over many decades, not reaching build-out levels for 80 to 125 years (or by 2094 to 2139) or more.

The projected student populations above at the elementary, middle, and high school levels due to increased population in the subarea under Alternative 4—Preferred Alternative would definitely require the need for additional schools and supporting facilities, as well as staff, facility, and ancillary services related to education. Because protected build-out would be expected to occur slowly, over the course of many decades (at the estimated average annual growth rate of 1.5 percent to 2.5 percent), the school district would be able to monitor growth, plan for, and procure resources for additional facilities and services based on growth trends over the course of many years.

It is important to consider the potential influence of anticipated housing types on school enrollment projections. There would be a greater diversity of housing types in the station subarea, including a variety of multi-family and single family attached residences. Traditionally, families with higher ratios of students per household have tended to live in single family residences in the region. However, this trend has been changing in recent years, with more fluctuation in household sizes. More people are choosing to live in smaller-sized residences including multi-family homes. At the same time, household sizes overall in the US have seen a decline over the last ten years. The factor of .33 students per household being applied in the subarea represents an overall average for all households in Shoreline. While this factor could potentially be less in the subarea with future build-out given the trends described above, it is being applied to this analysis to plan for the greatest potential. Since Shoreline is a desirable community for families and the school district, the community could tend to attract more families as a result of providing new and varied housing opportunities.

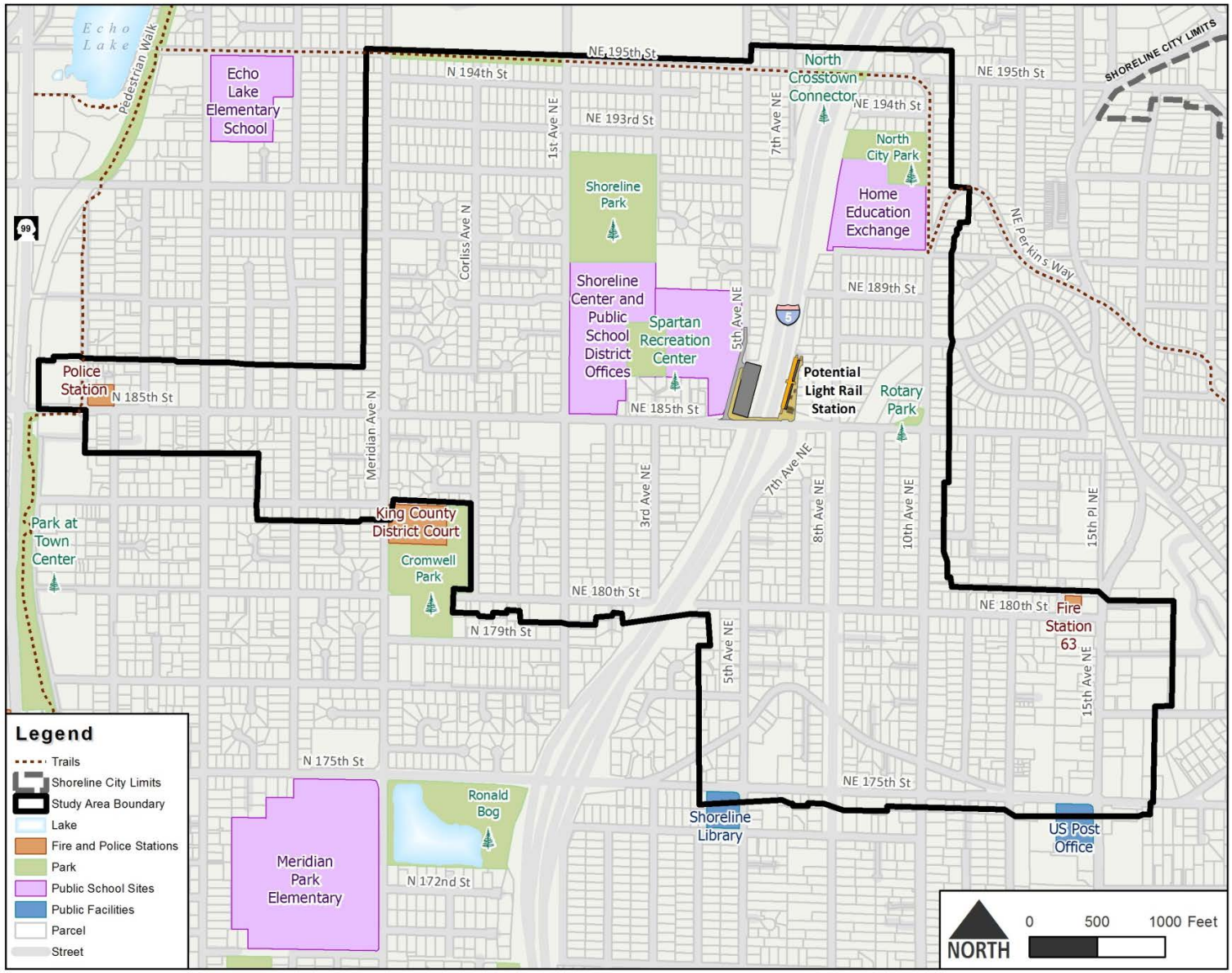


Figure 3.4-1 Public and Community Facilities in the Vicinity of the Subarea

Table 3.4-1
Public Schools and School District Facilities

	School Name	Grades Served	2013 Enrollment	Location
Preschool/Daycare Centers[1]				
	Shoreline Children's Center*	N/A		1900 N 170th Street
	School Name	**Grades Served**	**2013 Enrollment**	**Location**
Elementary Schools				
	Echo Lake Elementary*	K-6	481	19345 Wallingford Avenue N
	Meridian Park Elementary*	K-6	450	17077 Meridian Avenue N
	Ridgecrest Elementary*	K-6	475	16516 10th Avenue NE
	Briarcrest Elementary	K-6	715	2715 NE 158th Street
	Brookside Elementary	K-6	513	17447 37th Avenue NE
	Highland Terrace Elementary	K-6	433	100 N 160th Street
	Parkwood Elementary	K-6	444	1815 N 155th Street
	Syre Elementary	K-6	523	19545 12th Avenue NW
Middle Schools				
	Einstein Middle School	7-8	700	19343 3rd Avenue NW
	Kellogg Middle School*	7-8	625	16045 25th Avenue NE
High Schools				
	Shorecrest High School*	9-12	1,500	15343 25th Avenue NE
	Shorewood High School	9-12	1,600	17300 Fremont Avenue N

Table 3.4-1
Public Schools and School District Facilities,
Continued

Other Facilities				
	Cascade (Alternative Learning Choice School)*	K-8	145	17077 Meridian Avenue N.
	The Shoreline Center*			18560 1st Avenue NE
	Home Education Exchange*			816 NE 190th Street
	Transportation Center			124 NE 165th Street
	Warehouse and Central Kitchen			2003 NE 160th Street

Notes:

* These are located in proximity to the subarea (either within or nearby).

1 This school is publicly operated by the Shoreline School District. There are several additional privately operated preschools and daycare centers within and in proximity to the subarea including the North City/Shoreline Cooperative Preschool, which is located in the subarea.

Table 3.4-2
Enrollment by School Level—Shoreline School District
(2012-2013 School Year)

Number of Students	Percentage of Total	School Level
4,289	49.22%	Elementary School
1,325	15.21%	Middle School
3,100	35.57%	High School
8,714	**100%**	**Total Number of Students**

The Next Twenty Years (Up to 2035) for Any Action Alternative

Under all action alternatives, there would be an increased demand for schools and school facilities over the next twenty years. It is estimated that there potentially would be the following total student populations in the subarea per school level:

- 723 to 893 elementary students
- 223 to 276 middle school students
- 522 to 646 high school students

The Shoreline School District will review these numbers as part of their ongoing planning for school facilities and begin to determine how to address the population growth in the coming years.

Alternative 3 – Previous Most Growth

Under the Alternative 3—Previous Most Growth, population and housing growth would place increased demands on the school district, creating the need for additional facilities and employees. This increased demand would be higher than under Alternatives 1 and 2, but less than Alternative 4. The total population would be expected to increase to 37,315 people living in 15,548 households under Alternative 3—Previous Most Growth. This is 29,371 more people and 12,238 more households than under today's levels. Using the .33 students/household factor, approximately 5,131 students would be generated by the anticipated growth. Applying the proportional factors per school level based on today's demographics, this would equate to the following estimated student population:

- 2,526 elementary school students
- 780 middle school students
- 1,825 high school students.

In addition to increased student enrollment, Alternative 3 would create a higher demand for other types of public school services, such as preschool and extracurricular activities, than under Alternatives 1 and 2, but less than under Alternative 4.

As under the other action alternatives, it should be noted that full build-out under Alternative 3 would not be anticipated to occur by 2035. Based on market factors, property characteristics, and current population growth trends in Shoreline and the region, this level of growth would be anticipated to occur over many decades, not reaching build-out levels for 60 to 100 years (or by 2075 to 2115) or more.

The projected student populations above at the elementary, middle, and high school levels due to increased population in the subarea under Alternative 3—Previous Most Growth would most definitely require the need for additional schools and supporting facilities, as well as staff, facility, and ancillary services related to education. Because protected build-out would be expected to occur slowly, over the course of many decades, the school district would be able to monitor growth, plan for, and procure resources for additional facilities and services based on growth trends over the course of many years.

Alternative 2 – Some Growth

Under Alternative 2—Some Growth, population and housing growth would create increased demand for school facilities and services, including additional buildings and employees. The population will grow to 17,510, living in 7,296 households in the station subarea. This would be an increase in population of 9,566 people and 3,986 households above current levels in the subarea. Using the .33 students/household factor, approximately 2,408

students would be generated by the anticipated growth. Applying the proportional factors per school level based on today's demographics, this would equate to:

- 1,185 elementary school students
- 366 middle school students
- 857 high school students.

In addition to increased student enrollment, Alternative 2 would create a higher demand for other types of public school services, such as preschool and extracurricular activities, than under Alternative 1.

As with the other action alternatives, full build-out of Alternative 2—Some Growth would not be anticipated to occur by 2035 (as in Alternative 1-No Action). Based on market factors and current population growth trends in Shoreline, this level of growth would be anticipated to occur over many decades, perhaps not reaching build-out levels for 30 to 50 years (or by 2045 to 2065) or beyond.

Given the student populations projected above at the elementary, middle, and high school levels, it is likely that the increased population in the subarea under Alternative 2 would require the need for additional schools and supporting facilities, as well as staff, facility, and ancillary services related to education. Because projected build-out would be expected to occur slowly, over the course of many decades, the school district would be able to monitor growth, plan for, and procure resources for additional facilities and services based on growth trends over the course of many years.

Alternative 1 - No-Action

Under Alternative 1—No Action, there would be no changes to zoning, but ongoing population growth and new housing construction in the subarea would place additional demands on school services and facilities. The population of the subarea would be anticipated to increase to 8,734 by 2035 under the No Action Alternative. This compares to a current population of 7,944 people, indicating a population growth of 790 people without any changes to zoning. Today there are 3,310 households in the subarea, and these would increase to 3,639 by 2035 under the No Action Alternative, increasing the number of households by 329. For Alternative 1, it is estimated that of 1,201 new students generated over the period from 2014 to 2035, there would be:

- 591 elementary school students
- 183 middle school students
- 427 high school students.

In comparing these levels to existing enrollment levels in existing schools as a portion of the total enrollment generated citywide and by Lake Forest Park households, it would appear that these students could be accommodated within the existing school facilities.

Mitigation Measures

Background Considerations

In February 2014, two replacement levies were approved to extend financial support for educational programs, maintenance and operations, and technology improvements. These levies would need to be renewed in the future in order for the district

to continue to provide a level of service consistent with current conditions. The voting population has been supportive of school district levies, and it is anticipated (but not certain) that as more households with students move into the district, voters would continue to be supportive of future levies.

Mitigation measures that would address the potential impacts described above follow.

- The school district will continue to monitor growth levels within its service area, including the station subarea, and document trends in student enrollment in order to plan, prepare, and secure resources for the addition of facilities and services to support the growth.

- The school district retains properties for future uses that may be needed. The North City Elementary school site, which is currently not being used as an elementary school, should be retained for future potential school use to serve the growth projected for the subarea. The Shoreline Center also could be redeveloped, and reorganization of site uses could create space for additional school buildings and facilities.

- For classroom expansion needed on an ongoing basis, the school district owns several portables for siting at impacted schools. If necessary, the school district could purchase or lease more, although this is not a preferred long-term operation scenario.

- The district also has the ability to alter or shift special program assignments to available space to free up space for core programs: gifted programs, special education, arts, activities, and others.

- Boundary adjustments could occur to reallocate the area from which individual schools draw attendance. As completed recently with the high schools, expansion of affected schools, if feasible without eliminating required playfields or parking, could be a planned improvement to accommodate increases in demand.

- The City of Shoreline does not currently charge impact fees to new development applications for school facilities. The City should coordinate with the Shoreline School District to monitor and determine the potential need for an impact fee program over time. For example, King County charges school impact fees to development projects in unincorporated areas. Impact fees are adopted annually by ordinance following a thorough review by the School Technical Review Committee and the King County Council of the each district's capital facility plan and enrollment projections. Fees vary per school district and are assessed and collected for every new residential dwelling unit. Low-income housing, senior housing, and community residential facilities are exempt from the fee program.

Significant Unavoidable Adverse Impacts

Under any of the alternatives, population growth and increased numbers of households would create additional demand for public school services and facilities. The anticipated increases in student population would be expected to manageable since they would occur over several decades. The school district would have the ability to monitor growth in enrollment over time and plan,

prepare for, and secure resources to increase the level of services and facilities to serve additional students as needed. Advancements in technology, educational programs, and teaching methods may also play a factor in accommodating the anticipated increases in demand on the public school system.

3.4.2 Parks, Recreation, and Open Space

Affected Environment

The Parks, Recreation, and Cultural Services (PRCS) Department of the City of Shoreline oversees the city's 404 acres of park property and provides recreational opportunities for Shoreline residents and the communities in the surrounding region. The department consists of three divisions: Administration, Parks Operations, and Recreation. From 2010 -2011, the City developed the 2011-2017 Parks, Recreation, and Open Space (PROS) Plan to build a framework for future maintenance and development of Shoreline's parks, recreation, and cultural service programs to serve the community as the population grows, demographics change, and financial situations evolve. The PROS Plan may be downloaded and reviewed for more information at: http://www.cityofshoreline.com/government/departments/parks-recreation-cultural-services/projects-and-plans/parks-recreation-and-open-space-plan

The PROS Plan articulates a vision and goals and policies for the City's parks, recreation, and cultural services program and facilities.

Vision—Provide quality parks, recreation, and cultural services to promote public health and safety; protect our natural environment; and enhance the quality of life of our community.

Goals and Policies:

1. The preservation, enhancement, maintenance, and acquisition of facilities
2. Diverse, affordable community-based recreational, cultural, and arts programs
3. Equitable distribution of resources
4. Partnerships that maximize the public use of all community resources
5. Community engagement in parks, recreation, and cultural service activities and decisions

In order to the assess level of service of existing facilities, the PROS Plan classifies parks and recreation facilities into the following categories:

- Regional Parks
- Large Urban Parks
- Community Parks
- Neighborhood Parks
- Natural Areas
- Special Use Facilities
- Street Beautification

Shoreline's 404 acres of park and recreational lands and facilities fit into these classifications, including passive and active recreation parks, open spaces, natural areas, trails, and recreational facilities, as described in more detail below.

- **Regional Parks:** This park classification serves the city and beyond. These are often large parks and include a special feature that makes them unique. They also accommodate a mixture of active and passive activities and sometimes offer a wide range of amenities. Richmond Beach Saltwater State Park is Shoreline's only Regional Park at 32.4 acres of land. This facility provides a citywide level of service.

- **Large Urban Parks:** These parks serve a broad purpose and population, and can serve neighborhood and community park functions. The focus is on providing a mixture of active and passive recreation opportunities that serve diverse interests. There are two parks in Shoreline with this classification, Hamlin and Shoreview, covering a total of 127.5 acres. A facility of this type provides a citywide level of service.

- **Community Parks:** The purpose of a community park is to meet community based active, structured recreation needs and to preserve unique landscapes and open spaces. They are designed for organized activities and sports, although individual and family activities are also encouraged. Shoreline has seven community parks totaling over 101 acres. This type of facility typically provides a level of service to populations located within one and a half miles from the park.

- **Neighborhood Parks:** A neighborhood park is a basic unit of the park system that serves as the recreational and social focus of the neighborhood within an estimated 15 minute walking time. The overall space is designed for impromptu, informal, unsupervised active and passive recreation, as well as more intense recreational activities. Shoreline has seven neighborhood parks ranging in size from 1.8 – 4.5 acres and encompassing a total of 26.1 acres of land. Neighborhood parks typically serve populations located within one-half mile of the park.

- **Natural Areas:** This category includes areas developed to provide aesthetic relief and physical buffers from the impacts of urban development, and to offer access to natural areas for urban residents. These areas may also preserve significant natural resources, wildlife habitat, native landscapes, and open spaces. These areas typically serve populations located within one-half mile from the area. Shoreline has 11 areas categorized as natural areas, which total 80 acres. See more discussion later in this section under "Open Space, Trees, Vegetation, and Habitat."

- **Special Use Facilities:** These facilities and places provide unique recreational experiences and although not all are located in the subarea, they provide a citywide level of service (and as such, would serve future residents of the subarea). These include the Shoreline Pool, Spartan Recreation Center, Kruckeberg Garden, and the Interurban and North Crosstown Connector Trails.

- **Street Beautification:** Street Beautification sites are small areas or street corridors that have been developed in and around the public right-of-way. These sites provide aesthetic relief, enhance pedestrian safety, and provide limited active recreational opportunities. In the subarea,

these sites include Rotary Park, Aurora Corridor, and the North City Business Corridor. Small public gathering spaces, such as urban plazas, pocket parks, and parklets may be located along and adjacent to street corridors, particularly with neighborhood redevelopment.

There are more than 17 acres of park land and 40,000 square feet of recreational facilities within the station subarea or in near proximity to it. A portion of the Interurban and North Connector Trail systems are also located in the subarea. Park assets located in proximity to the subarea are described below.

- ***Shoreline Park:*** This is an 11.6 acre Community Park located in the north central portion of the city in the Echo Lake Neighborhood. There are two synthetic turf soccer fields, a natural wooded area to the north, and the Shoreline Pool. The site is adjacent to the Spartan Recreation Center, the Shoreline Center, and the Shoreline Stadium.

- ***North City Park:*** This is a 4.0 acre Natural Area located in the northeast portion of the city in the North City Neighborhood. The site is heavily wooded, with walking trails. Development is limited to a circular asphalt trail with an interpretive display and plan identification markers.

- ***Interurban Trail:*** This trail is the spine of the City's bicycle and pedestrian trail system and provides an important link in the regional trail system. Extending north-south through the city from Seattle to Edmonds and beyond, this trail is a paved, multi-purpose pedestrian and bicycle trail that is located off Aurora Avenue N and follows a linear corridor along Seattle City Light property. The trail connects neighborhoods to shopping, services, employment, transportation centers, and parks, and allows for the use of commuters as well as recreational bicyclists, walkers, and joggers. In the city, the entire trail corridor covers 21.2 acres and 3.25 miles of trail. A portion of this trail at N 185th Street and Aurora Avenue N is located in proximity to the subarea.

- ***North Crosstown Trail Connector:*** This is a 1.8 acre Special Use Facility located in the north end of the subarea along N 195th Street between 1st Avenue NE and Meridian Avenue N. It is a grade separated pedestrian and bicycle trail connector to support an east-west connection between the Interurban and Burke-Gilman Trails. This trail aligns with the pedestrian and bicycle bridge crossing Interstate 5 at N 195th Street. The City will continue improving bicycle and pedestrian mobility along 195th to extend this multi-modal corridor.

- ***Shoreline Pool:*** Classified as a Special Use Facility, this 15,375 square-foot recreational pool is located adjacent to Shoreline Park on school district property. Maintained by the City, the building features a six lane, 25 yard pool ranging from four to twelve feet in depth; a six lane, ten-yard shallow section (three-feet in depth); a diving board; and rope swing. The pool is open to the public during posted hours and available for rental for special events.

- ***Spartan Recreation Center:*** This 25,000 square-foot recreational facility is located adjacent to the Shoreline

Center and is used for a variety of Shoreline School District and City of Shoreline Parks, Recreation, and Cultural Services programs and activities. The Spartan Recreation Center is available for drop-in recreation when other programs are not scheduled and can be rented for special events and programs.

- ***Rotary Park:*** This is a 0.3 acre Street Beautification asset located in the northeast portion of the city in the North City Neighborhood. The site is a small segment of public right-of-way at the northwest corner of N 185th Street and 10th Avenue NE. Site amenities include seating. The City and Parks Board will need to consider the best use for this land, given its proximity to the 185th Street station. One option is retain it as a park and enhance the space with public art. Another is to incorporate it into a future redevelopment project, possibly with the criteria that the park space be replaced elsewhere in the development or nearby.

- In addition to the above park assets, the subarea benefits from being located within service areas of additional Parks, Special Use Facilities, and a Natural Areas located outside of the subarea boundary, but within near proximity to the subarea. These facilities are described below.

- ***Cromwell Park:*** This 9.2-acre Community Park is located in the central portion of Shoreline in the Meridian Park neighborhood. In 2010 a major renovation of the park was completed to provide paths, an overlook, and a natural area. Major park amenities included a restroom, amphitheater and stage, play structure and swings, basketball court, stormwater retention features, and a play field.

- ***Brugger's Bog Park:*** This Neighborhood Park is located in the northeastern portion of the city. The park is adjacent to Aldercrest School, and has access to Lyons Creek. It is a 4.5-acre park with picnic tables, play structures, swings, and various natural features.

- ***Echo Lake Park:*** This Neighborhood Park is 2.4 acres and located in the northern portion of the city on the edge of Echo Lake with a public access area/boardwalk. The area surrounding the park is heavily developed and consists primarily of high-density residential in mixed use buildings (with retail at the ground floor). The Interurban Trail Corridor is on the eastern boundary of the park.

- ***James Keough Park:*** Located in the central portion of the city in the Meridian Park Neighborhood, this 3.1-acre Neighborhood Park is adjacent to Interstate 5. Several non-park public facilities are in the vicinity of the park. Amenities include play equipment, a soccer field, a basketball court, and a bench.

- ***Northcrest Park:*** This is Shoreline's largest Neighborhood Park at 7.3 acres. It is located in the eastern portion of the city in the Ridgecrest Neighborhood. The park is heavily wooded and completely surrounded by single family residences. The park is long and linear approximately 300 feet in width by 1,050 feet in length.

- ***Hamlin Park:*** This Large Urban Park is 80.4 acres and was recently improved in 2010. With a citywide service area, the park provides a variety of active and passive uses and natural areas.

- ***Ronald Bog Park:*** This 13.4-acre Natural Area is located in the central portion of the city in the Meridian Park neighborhood. The focal point of this park is a small pond that serves an important function in stormwater management.

- ***Park at Town Center:*** This is a Special Use Facility on 3.6 acres of land. This site is identified as a celebratory park space. Spanning from the west sidewalk of Aurora Avenue N to the east margin of Midvale Avenue N, this is a linear park developed to accommodate major gatherings.

- ***Shoreline Civic Center:*** The Civic Center provides a fixed location for citizens to meet, exchange ideas, and explore issues that support and benefit the community. Located at City Hall, this Special Use Facility is adjacent to the Interurban Trail, the Park at Town Center, and is serviced by major transit routes.

The Shoreline Public School District is an additional resource for neighborhood park amenities ant facilities within and surrounding the subarea. Consideration of service from these facilities increases the availability of park assets to the subarea. In the subarea, school recreation facilities include:

- ***Echo Lake Elementary***—grass field, play equipment, basketball court

- ***Meridian Park Elementary***—grass field, play equipment, basketball court, dirt track, dirt/grass baseball field, tennis courts (2)

- ***North City Elementary site***—grass field, play equipment, basketball court

- ***Ridgecrest Elementary***—grass field, play equipment, basketball court

- ***Kellogg Middle School***—full size turf, track-six lanes

- ***Shorecrest High School***—full size turf, track-eight lanes, turf baseball field, discus area (grass), shot put area, tennis courts (4)

- ***Shoreline Stadium***—full turf, track-eight lanes, grass discus area, shot put and javelin areas

Other recreation facilities at the Shoreline Center include soccer fields and tennis courts. Other schools outside of the subarea but in close proximity provide similar types of facilities as those listed above.

Community Interests and the Projected Demand for Additional Parks, Recreation, and Open Space Facilities and Services

During development of the PROS Plan (completed in 2011), a community outreach process was used to identify community needs and inform potential improvements to level of service. The

City conducted a Community Needs Assessment Survey. Results of the outreach process and survey are summarized below.

- Park and recreation usage in the community is high.
- Additional restrooms and walking trails continued to be the most desired park improvements.
- While there are a wide range of park and recreation needs, the City of Shoreline is currently meeting most of the needs of the community with paved walking and biking trails, playfields, and new neighborhood park amenities (such as shelters, drinking fountains, playgrounds, and walking trails).
- Deficiencies exist between demand and assets with regard to the community's expressed desire for a new aquatic center and cultural arts facility.
- Community participants believed the future focus should be on improving and maintaining existing facilities and developing proactive partnerships.
- The City of Shoreline has studied how to enhance energy efficiency at the Shoreline Pool since the facility is the largest consumer of electricity of City-managed assets. With a modern building and integrating other uses in more of a multi-purpose recreation center, energy efficiency and public functions could be greatly enhanced. If the Shoreline Center were redeveloped in the future, the City would be interested in partnering with the School District to consider how facilities could be integrated between the two sites. For example, Spartan Gym could be combined in a new facility, built to green building standards, that houses multiple functions including a new pool and other recreation resources.

Level of Service Assessment

The City uses a combination of community participation and review of the classifications and their service areas described above to assess demand. Classifications set the stage for analyzing need (also described as level of service). Level of service is a term that describes the amount, type, or quality of facilities that are needed in order to serve the community at a desired and measurable standard. The PROS Plan analyzed level of service based on geographic service area standards for community and neighborhood park classifications. (Neighborhood parks have a 1/2 mile service area and community parks have a 1-1/2 mile service area.) The City's analysis also takes into consideration the inclusion of Shoreline School District property and other community and large urban parks that provide neighborhood park amenities.

Figures 3.4-2 and 3.4-3 from the PROS Plan illustrate community park and neighborhood park service areas in the City of Shoreline. As shown in these figures, all of the subarea is located with community park service areas and portions are located within neighborhood park service areas. Areas of the subarea not served by neighborhood parks are served by Shoreline School District sites, which provide neighborhood park amenities, as shown in Figure 3.4-4 (also from the PROS Plan). However, it is important to note that some of these school sites may be re-converted back to school use in the future, reducing their level of service for neighborhood park use (although school grounds and facilities such as the gyms could still serve some neighborhood recreation

functions).

In review of the overlapping service areas mapped by the City, most of the demand for parks and recreation is currently being met by existing facilities. However, the PROS Plan does identify the northeast area of the city as an area of deficiency, and indicates that the possible of acquisition of two new park locations at Aldercrest and Cedarbook would help in addressing the deficiency.

In the 185th Street Station Subarea, the mapping shows that there is a current lack of neighborhood parks to serve the existing population. This would continue with future redevelopment if no additional neighborhood parks are created (as discussed later under impacts analysis). While the proximity of schools could help to serve residents' needs in the subarea, there will be a need for parks to serve the neighborhood in the future. The City anticipates placing more focus on this need and identifying potential parks and recreation opportunities for the subarea in the coming years.

Planned Improvements and Desired Amenities

The PROS Plan identified the following projects are listed in the six-year capital improvement plan for 2012-2017 that potentially could include funding of parks and trails in the vicinity of the subarea:

- Parks repair and replacement funding
- Trail corridors
- King County Trails Levy funding

The PROS Plan also identifies potential new facilities, including the following in proximity to the station subarea:

- Open space for park use as part of the Aldercrest annex site and the development of the old Cedarbook elementary school site
- Echo Lake Park—parking improvements and park expansion (underway)

The PROS Plan identifies desired amenities as capital project ideas that did not have an intended facility/site. Five major amenities were identified as partnership opportunities with other agencies, such as the Shoreline School District and others:

- Aquatic Facility
- Cultural Arts Center
- Environmental Learning Center
- Farmers Market (currently being hosted at City Hall on Saturdays, June through October)
- Trail Connectors

Other desired amenities identified in the plan include a variety of recreational facilities, such as:

- Basketball courts
- Barrier-free playground
- Community gardens
- Disc golf courses
- Signage (directional, entry, interpretive)
- Skate parks
- Spray parks
- Swings
- Freeride bike parks
- Off-leash dog areas
- Putt-putt golf course
- Pickleball courts
- Tennis courts
- Water trails
- Wi-Fi in parks

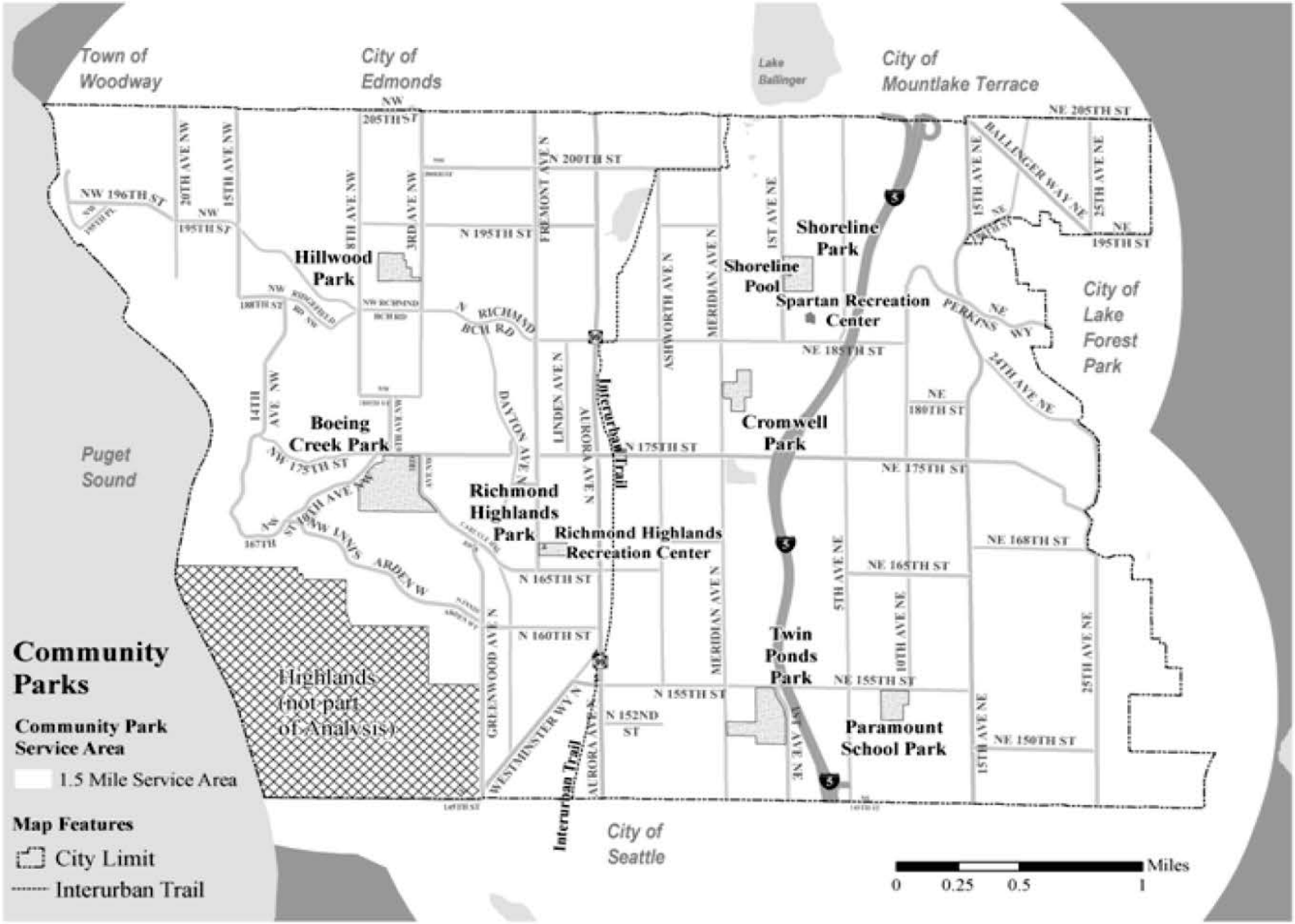


Figure 3.4-2 Community Park Service Area

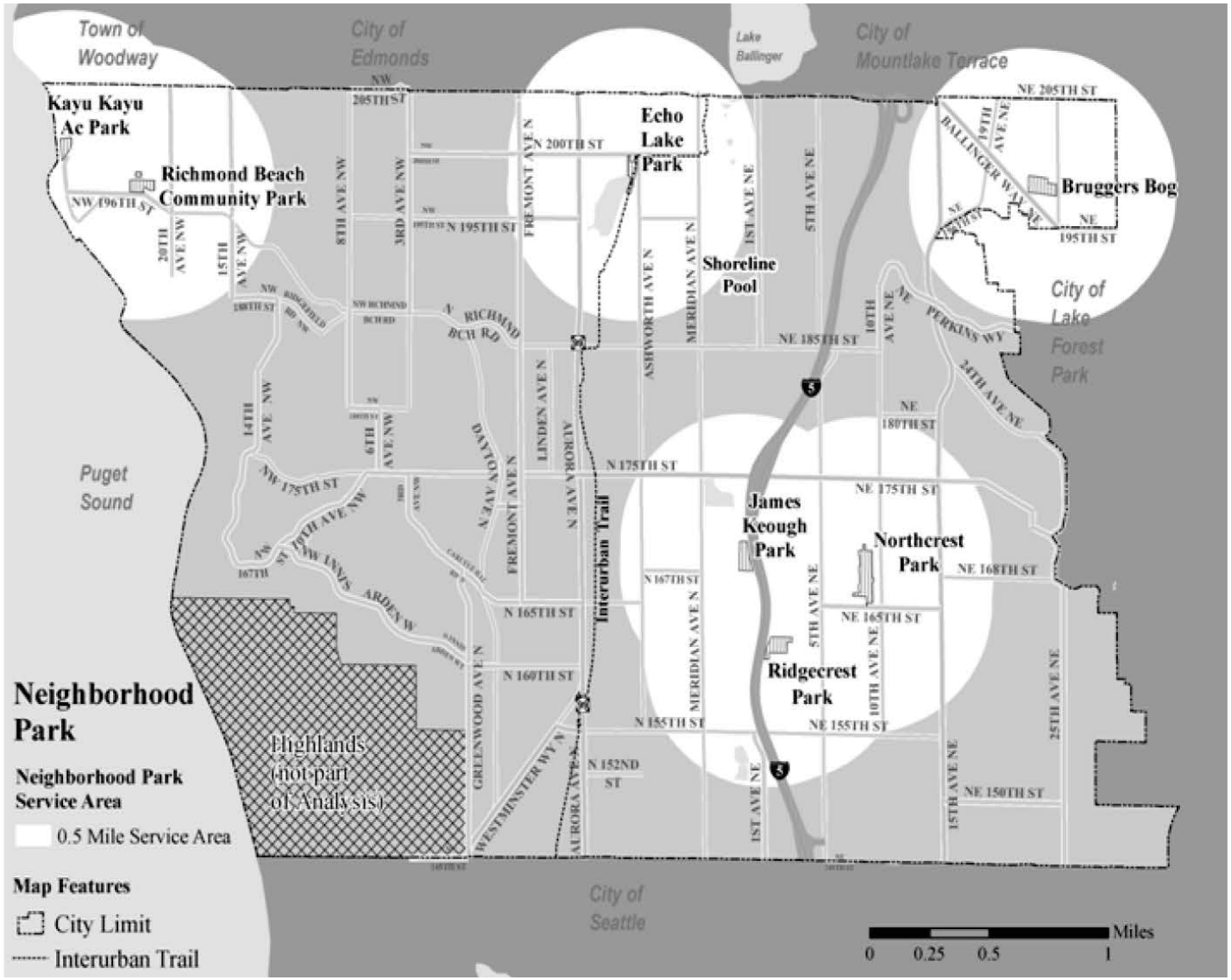


Figure 3.4-3 Neighborhood Park Service Area

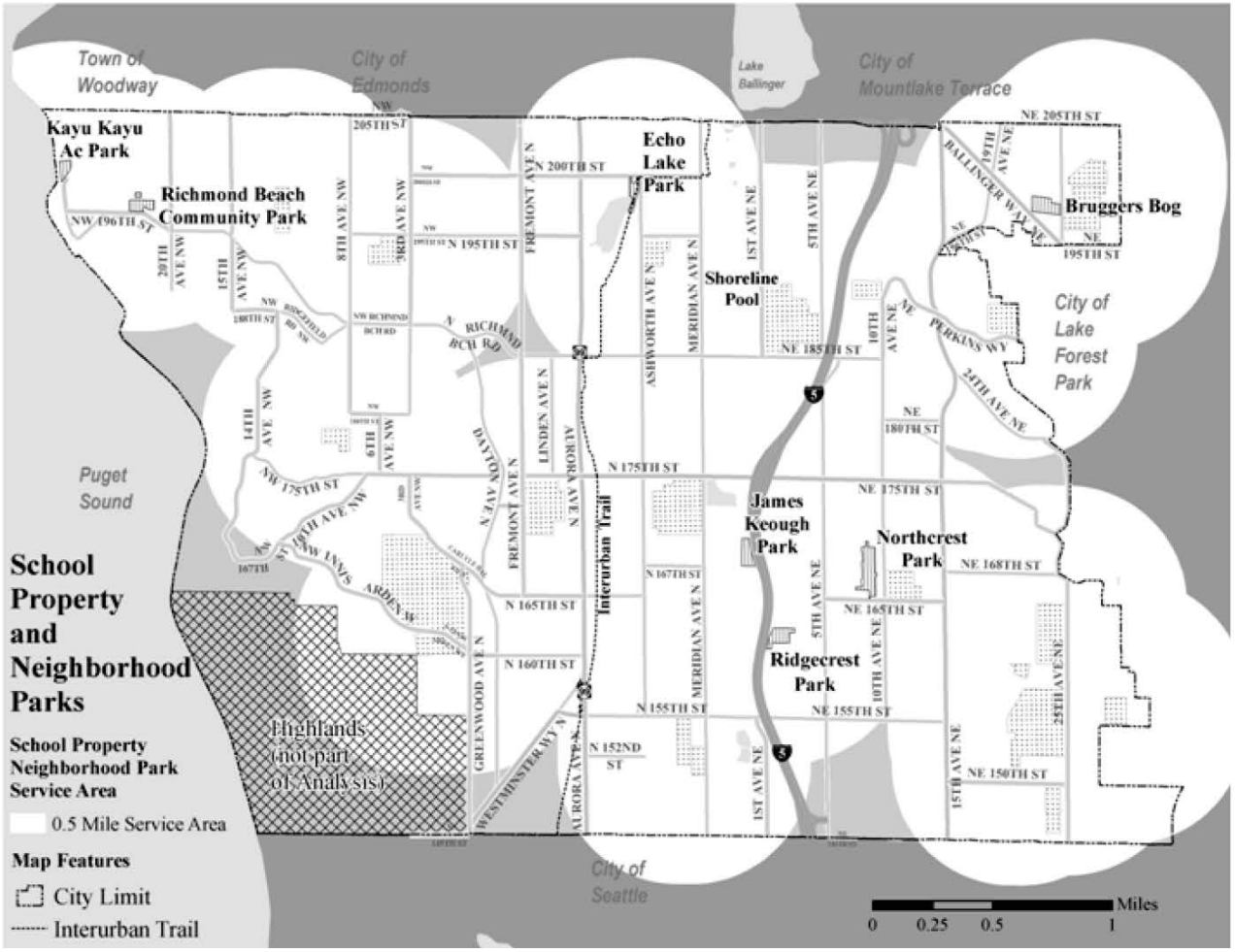


Figure 3.4-4 School District Amenities Service Area

The PROS Plan provides 20-year capital improvements recommendations focused on addressing the needs above. The scope of planned improvements to parks and recreation facilities ranges from master planning and conceptualization to design and implementation of improvements. Timing for these projects was categorized in the PROS Plan as short-term, mid-term, and long-term recommendations.

Open Space, Trees, Vegetation, and Habitat

Residents characterize Shoreline as a wooded community; this is often cited as a key reason for locating in the area. Large evergreen trees can be seen rising above residential neighborhoods, on hilltops, and even on the periphery of Aurora Avenue. As the city becomes more urbanized, it is a priority to maintain and enhance the tree canopy, and in 2012, the City took steps to be recognized as a Tree City. The City has also developed Vegetation Management Plans for parks, and will track tree canopy over time to gauge the effect of policies related to tree retention and replacement.

Forested open space, wetlands, and native vegetation found on steep slopes and in open space areas are important resources that should be preserved. Trees help stabilize soils on steep slopes, and act as barriers to wind and sound. Plants replenish the soil with nutrients, generate oxygen, and clean pollutants from the air. Native vegetation provides habitat for wildlife. Wetlands and riparian vegetation provide surface water storage and help clean surface water of pollutants and sediment. Aerial photos show that the community is a mosaic of various types of vegetation. The largest, most contiguous areas of native vegetation in Shoreline are primarily found in city parks, publicly owned open space, and privately owned open space areas. These areas include the highest quality wildlife habitat found in the city. However, areas of less intensive residential development also contain mature trees and other native vegetation, which provide secondary wildlife habitat and substantially contribute to the quality of life in Shoreline.

Lakes and wetlands also provide valuable habitat in Shoreline. There are two lakes in proximity to the subarea: Echo Lake and Ronald Bog. Shoreline's lakes contain pollutants and contaminated runoff, including fertilizers and pesticides from lawns and gardens; oils, greases, and heavy metals from vehicles; and fecal coliform bacteria. The quality of the water in the lakes is a concern to many residents and City staff. Ronald Bog was historically dredged. As urban development has occurred, the process by which the nutrient level and vegetation in these lakes increases has accelerated. It is anticipated that Ronald Bog will eventually revert to a bog.

Wetlands perform valuable functions that include surface and flood water storage, water quality improvement, groundwater exchange, stream base flow augmentation, and biological habitat support. With the exception of the Puget Sound estuarine system, all wetlands in the city are palustrine systems (freshwater). The largest palustrine system is Echo Lake, located to the northwest of the subarea. Ronald Bog also is a large wetland.

Most wetlands in the city are relatively isolated systems and surrounded by development. Under the Shoreline Municipal Code, wetlands are designated using a tiered classification system (from Type I to Type IV) based on size, vegetative complexity, and the presence of threatened or endangered species. No wetlands

in the city have received a Class I rating. All wetlands, regardless of size, are regulated under the Shoreline Municipal Code. When a development is proposed on a site with known or suspected wetlands, a wetland evaluation is required to verify and classify wetlands and delineate boundaries and buffer areas. The State Department of Ecology mandates minimum wetland buffer areas based on typology and other factors.

All of the documented wetlands within the city have experienced some level of disturbance as a result of development and human activity. Disturbances have included major alterations, such as wetland excavation, fill, or water impoundment. Some wetland areas occur within parks that receive constant use by people, threatening the wetlands with impacts from human activity, such as trash and trampling of vegetation.

Habitat Protection

The process of urbanization can result in the conversion of wildlife habitat to other uses. The loss of certain types of habitat can have significant, adverse effects on the health of certain species. Fish and wildlife habitat conservation areas are those that are necessary for maintaining species within their natural geographic distribution so that isolated subpopulations are not created. Designated habitats are those areas associated with species that State or federal agencies have designated as endangered, threatened, sensitive, or candidate species. Currently in the Puget Sound, the bald eagle and Chinook salmon are listed as threatened species by the federal government under the Endangered Species Act.

Priority Habitat Areas— The Washington Department of Fish and Wildlife (WDFW) indicates bald eagle territory in the Richmond Beach and Point Wells areas, outside the subarea. WDFW maps and the City's stream inventory indicate the presence of Chinook salmon in portions of McAleer, Thornton, and Boeing Creeks, outside the subarea. Other sources have indicated the presence of fish in other streams within the city, although the full extent of fish habitat has not been confirmed.

To help restore healthy salmon runs, local governments and the State must work proactively to address salmon habitat protection and restoration. WDFW has developed the Priority Habitats and Species (PHS) Program to help preserve the best and most important habitats, and provide for the life requirements of fish and wildlife. The City has developed mapping of PHS areas based on data provided by the WDFW and other mapping resources.

WDFW provides management recommendations for priority species and habitats that are intended to assist landowners, users, and managers in conducting land use activities in a manner that incorporates the needs of fish and wildlife. Management recommendations are developed through a comprehensive review and synthesis of the best scientific information available. The City has reviewed the PHS management recommendations developed by WDFW for species identified in Shoreline, and used them to guide the development of critical areas regulations that fit the existing conditions and limitations of Shoreline's relatively urbanized environment.

Refer to Figure 3.4-5 for a depiction of urban forest and priority habitat areas that the City has mapped in the vicinity of the subarea. Ronald Bog is the only priority habitat area in the

subarea. Urban forest areas are shown in green and include areas such as Shoreline Park, North City Park, Rotary Park, and sloped topographic areas along the interstate corridor and elsewhere.

Critical Areas Ordinance— The City of Shoreline has an adopted Critical Areas Ordinance and correlating Code requirements (Chapter 20.80). The ordinance specifies regulations related to habitat protection. For example Section 20.80.300 describes mitigation performance standards and requirements, as follows:

A. Relevant performance standards for other critical areas (such as wetlands and streams) that may be located within the fish and wildlife habitat conservation area, as determined by the City, shall be incorporated into mitigation plans.

B. The following additional mitigation measures shall be reflected in fish and wildlife habitat conservation area mitigation planning:

1. The maintenance and protection of habitat values shall be considered a priority in site planning and design.

2. Buildings and structures shall be located in a manner that preserves and minimizes adverse impacts to important habitat areas. This may include clustering buildings and locating fences outside of habitat areas.

3. Retained habitat shall be integrated into open space and landscaping.

4. Where possible, habitat and vegetated open space shall be consolidated in contiguous blocks.

5. Habitat shall be located contiguous to other habitat areas, open space or landscaped areas both on and offsite to contribute to a continuous system or corridor that provides connections to adjacent habitat areas.

6. Native species shall be used in any landscaping of disturbed or undeveloped areas and in any enhancement of habitat or buffers.

7. The heterogeneity and structural diversity of vegetation shall be emphasized in landscaping.

8. Significant trees, preferably in groups, shall be preserved, consistent with the requirements of Chapter 20.50 SMC, Subchapter 5, Tree Conservation, Land Clearing and Site Grading, and with the objectives found in these standards. (Ord. 398 § 1, 2006; Ord. 238 Ch. VIII § 4(E), 2000).

Department of Ecology Surface Water Management Regulations—The Department of Ecology (DOE) requires surface water management compliance of development projects. DOE regulations list preservation of native trees, vegetation, and undisturbed ground, along with other tools and best practices, as effective methods for managing surface water runoff and enhancing water quality. More information about DOE regulations is provided in Section 3.5 of this FEIS.

Figure 3.4-5 Urban Forest and Priority Habitat Areas (Ronald Bog and Echo Lake) Mapped in the Vicinity of the Subarea

Analysis of Potential Impacts

The anticipated demand for parks and recreation facilities under the alternatives is analyzed below. Table 3.4-3 provides a summary of the estimated demand for parks under the alternatives.

Alternative 4—Preferred Alternative

Under the Alternative 4—Preferred Alternative, population growth (both housing and employment) would result in increased demands for parks, recreation, and open space resources. This increased demand would be higher than under the other alternatives. The total population would be expected to rise to 56,529 people living in 23,554 households under Alternative 4—Preferred Alternative. This is 48,585 more people and 20,244 more households than under today's levels. It is estimated that there also would be an additional 15,340 employees in the subarea at build-out.

When considering the specific type of facilities the increased population will need, it is important to consider a number of factors, including community involvement, availability of the different classifications of parks and open space, and level of service standards. Community involvement during the subarea planning process has confirmed that residents are interested in ensuring that neighborhood parks and other facilities (playgrounds, public gathering spaces, teen centers, etc.) are available to serve new residents as they move to the area in the future. They are also interested in public art, enhanced streetscapes, and other amenities.

While there appear to be adequate regional and community parks in Shoreline to serve future growth, neighborhood parks will be needed in the subarea as the population increases.

Neighborhood parks can vary in size, from one acre to up to fifteen acres. Most existing neighborhood parks in the City of Shoreline are between one acre and five acres in size.

Based on traditional National Park and Recreation Association (NPRA) standards, it is advisable to have a neighborhood park serving a half-mile area with population of up to 5,000 people. However, it should be noted that these standards are used with discretion in determining park needs, because every community is different and they may have various types of recreation

facilities that meet the demand even if they do not have the acreage.

So with consideration of the NPRA standard, the number of new residents in the subarea under Alternative 4—Preferred Alternative at build-out would be 48,585 (over today's existing number). Assuming that some existing facilities in the subarea and in surrounding areas are currently meeting neighborhood park needs, there could be an additional demand for approximately nine new neighborhood parks. Some of this demand could continue to be served by neighborhood school facilities as well as neighborhood parks in areas bordering the subarea. Most of the demand would need to be met by new parks, recreation, and open space facilities. Neighborhood parks could be integrated into the redevelopment of large parcels (such as the Shoreline Center site if it were to redevelop).

Implementation of urban plazas, pocket parks, playgrounds, trail corridors, and other open space as part of redevelopment projects could certainly also serve some of the demand for neighborhood park space.

Given the lack of available land and limited resources of the City to purchase land for development of new parks, dispersed mini-parks and urban plazas/public gathering spaces, which are smaller (one-half acre or less), could help to serve the demand in the subarea if incorporated into redevelopment projects. Every new development should be required to provide some level of park and open space use for residents, and the City should continually evaluate the best possible locations for creating new neighborhood parks as the subarea grows (see Mitigation Measures).

While multiple small neighborhood parks could be accommodated within the subarea as part of redevelopment and with the redevelopment of the Shoreline Center site and adjacent City property, it is unlikely that there would be enough geographic space for nine new neighborhood parks in the subarea. It is important to remember that the other level of service standard referenced is for neighborhood parks to serve an area within one-half mile. As such, if two to three new neighborhood parks were developed within the subarea, and other types of parks, recreation, and open space facilities are provided as part of redevelopment, the level of service likely would be sufficient for an urban neighborhood. (This assumes that existing neighborhood parks in areas near the subarea would be able to serve some of the growing population. In some cases, these existing neighborhood parks may need new facilities such as play equipment or other elements to improve their recreation capacity for use by the surrounding residents.)

The City intends to continue to monitor the need for parks as the neighborhood grows and to seek funding for, acquire property, and develop new neighborhood park facilities in the subarea to serve the growing population's needs. One of the important objectives of developing a subarea plan is to identify these key areas of need, so that the City and its partners can begin to proactively plan to serve these in the near term. Recognizing that property values likely would increase in the subarea in the future, it may be advantageous to seek property for parks and open space use in the near term.

Priority habitat areas such as Ronald Bog are protected by local, state, and federal regulations. Areas of urban forest are more vulnerable to potential impacts associated with redevelopment

in the subarea. The City's adopted critical areas ordinance calls for preservation of groups of mature trees, planting of native landscaping, and other provisions. DOE regulations related to surface water management also recognize preservation of natural areas as a best practice. Redevelopment projects in the subarea will be required to comply with these regulations as applicable.

The Next Twenty Years (Up to 2035) for Any Action Alternative

Under all action alternatives, the projected population of new residents would be 2,916 to 5,399 (in 1,140 to 2,190 households) by 2035, over the current level of 7,944 residents and 3,310 households in the subarea. There also would be an estimated 502 to 928 new employees by 2035. This level of population would equate to demand for approximately one new neighborhood park in place by the end of the twenty-year horizon of 2035, if not before.

Alternative 3 – Previous Most Growth

Alternative 3—Previous Most Growth Alternative would create a higher level of demand for parks, recreation and open space facilities than Alternative 2, but less than Alternative 4. It is estimated that an additional 29,371 people would be living in 12,238 households in the station subarea with the zoning changes. However, as stated above, this growth level would not be expected to be reached for 50 to 60 years or more (by 2065-2075 or beyond). This additional population would create a baseline demand for approximately six new neighborhood parks in the subarea. Assuming that school facilities would continue to serve part of the demand and given the lack of available land and space for new neighborhood parks, some of the demand potentially could be served by smaller-sized neighborhood parks and dispersed mini-parks, and urban plazas/public gathering spaces created as part of redevelopment sites.

Alternative 2—Some Growth

Under Alternative 2—Some Growth, the changes in zoning also would result in increased population and housing growth, but at a much lower level than under Alternative 4—Preferred Alternative or Alternative 3—Previous Most Growth. The increased population would place increased demands on parks, recreation, and open space, creating the need for additional facilities. The population would grow to 17,510, living in 7,296 households in the station subarea. This is an increase in population of 9,566 people and 3,986 households above current levels in the subarea. However, as stated under the analysis for schools, this growth would not be expected to occur by 2035, and likely will take several more decades based on market conditions, regional growth trends, and other factors. Full build-out of the proposed zoning likely could take 30 to 50 years (or by 2045 to 2055) or beyond.

Given the addition of 9,566 people to the subarea under the Some Growth Alternative, there would be a baseline demand for two new neighborhood parks. Although some of this demand could continue to be served by neighborhood school facilities, it would be advisable to seek opportunities to develop at least one new neighborhood park in the subarea to serve the growing population's needs. A neighborhood park could be integrated into the redevelopment of large parcels (such as the Shoreline Center site if it were to redevelop). Neighborhood parks can vary in size, from one to two acres to up to 15 acres or more. Given the lack of available land and limited resources of the City to purchase land for development of new parks, dispersed mini-

parks and urban plazas/social gathering spaces, which are smaller (one-half acre or less), could help to serve the demand if created as part of new redevelopment. Every new development should be required to provide some level of park and open space use for residents.

Alternative 1—No-Action Alternative

Under Alternative 1—No Action, the 2035 subarea population growth would place greater demands on the area parks, recreation, and open space. The population of the subarea is anticipated to increase to 8,734 by 2035 under the No Action Alternative. This compares to a current population of 7,944 people, indicating an estimated population growth of 790 people without any changes to zoning. Today there are 3,310 households in the subarea and this would increase to 3,639 by 2035 under the No Action Alternative, increasing the number of households by 329. It is anticipated that the current level of parks, recreation, and open space in the subarea would be sufficient to support the projected growth under Alternative 1—No Action. In reviewing the locations of neighborhood parks in proximity to the subarea, there is a baseline need for at least one and possibly two new neighborhood parks to serve the subarea; however, this need is mostly filled by existing school facilities in the area.

Demand for Other Human Services/Community Support Facilities

Under any of the action alternatives, the growing population of the subarea also will generate demand for a wide range of other human services and community support facilities, such as senior center facilities, community meeting and classroom facilities, recreation center facilities, etc. As discussed previously the Shoreline Center currently provides a wide range of these types of services and facilities to the community. The City of Shoreline and the Shoreline School District recognize how important the facilities at the Shoreline Center are to the community. As such, if the site were to redevelop in the future, one of the likely options would look at how to retain these facilities and services while also maximizing the use of the site for housing and mixed use. Refer to the previous Schools analysis in this section for more information.

Table 3.4-3
Estimated Demand for Parks

Time Frame	Alt. 4 Preferred Alternative	Alt. 3 Previous Most Growth	Alt. 2 Some Growth	Alt. 1 No Action
Twenty Years/ 2035	One New Neighborhood Park	One New Neighborhood Park	One New Neighborhood Park	No New Facilities
Build-Out	Nine New Neighborhood Parks or a Combination of Facilities to Meet the Demand	Six New Neighborhood Parks or a Combination of Facilities to Meet the Demand	Two New Neighborhood Parks or a Combination of Facilities to Meet the Demand	Not Analyzed

Mitigation Measures

Background Considerations

A number of park-related projects are currently in the PROS Plan recommendations list and the City's Capital Improvements Plan. The PROS Plan has short-term, mid-term, and long-term recommendations along with community goals during the current planning period. In the future, these recommendations will be reviewed annually and appropriately considered during budgeting of the Capital Improvement Plan. In proximity to the subarea, the current plan recommendations include property acquisition at Echo Lake and master planning and phase 1 implementation of the Shoreline Center. As stated above, it will be important to consider how neighborhood park facilities may be integrated with redevelopment of the Shoreline Center and adjacent City of Shoreline property.

The PROS Plan likely will receive updates in 2017, 2023, and 2029. At those times, the City will reassess the demands and needs and may modify recommendations based on budgeting, available funding, or environmental changes. With those updates, the City should carefully evaluate the level of recent and pending change in the station subarea and make recommendations for additional park, recreation, and open space facilities accordingly.

In addition to these activities that will help to ensure adequate parks, recreation, and cultural services are provided to the growing subarea, the following mitigation measures would be applicable to the three action alternatives: Alternative 4—Preferred Alternative, Alternative 3—Previous Most Growth, and Alternative 2—Some Growth.

- The proposed subarea plan policies related to parks, recreation, and open space should be adopted to support the development of needed facilities for future residents in the subarea. The policies call for:
  - Investigate potential funding and master planning efforts to reconfigure and consolidate existing City facilities at or adjacent to the Shoreline Center. Analyze potential sites and community needs, and opportunities to enhance existing partnerships, for a new aquatic and community center facility to combine the Shoreline Pool and Spartan Recreation Center services.
  - Consider potential acquisition of sites that are ill-suited for redevelopment due to high water table or other site specific challenges for new public open space or stormwater function.
  - Explore a park impact fee or fee in-lieu of dedication program for acquisition and maintenance of new parks or open space and additional improvements to existing parks. Funds from this program would allow the City to purchase property and develop parks, recreation, and open space facilities over time to serve the growing neighborhood.
- Proposed development regulations for the light rail station area should be adopted to require and/or encourage the provision of public space and recreation facilities with redevelopment projects, as part of Development Agreements (Chapter 20.30.355) and site design (Chapter 20.50.240). As part of negotiating

Development Agreements, the City could ask developers to select from a list of needed facilities. (See list of needed facilities earlier in this section, on pages 3-180 and 3-184.

- The subarea plan recommends creation of a variety of public spaces and recreational opportunities to serve the multi-generational needs of the growing transit-oriented community and capable of connecting to other facilities the subarea and throughout the city.
- As the City develops capital improvement projects in the subarea, funding should be retained for implementation of public park and recreation facilities that could be accommodated within public rights-of-way or utility easements (in cooperation with the utility providers). For example, in a conceptual analysis of the potential redevelopment of 8th Avenue NE completed as part of the subarea planning process, it was determined that sufficient right-of-way exists for development of community gardens, pedestrian/bicycle trails, or other features that would be compatible within the Seattle City Light right-of-way.
- The City would continue to monitor parks, recreation, and open space needs in the subarea and update the PROS plan in the future to address these needs.
- City policies and Code regulations related to natural areas and critical areas will be required of redevelopment projects in the subarea as applicable.

Significant Unavoidable Adverse Impacts

Under any of the alternatives, there would be an increased in demand for parks, recreation, and open space areas in the subarea. The demand would be substantially higher under Alternative 4—Preferred Alternative, than under Alternatives 3, 2, or 1. The demand for parks in the next twenty years would generally be the same under any alternative given that growth would be expected to stay at a similar pace of 1.5 percent to 2.5 percent annually.

As changes in population occur throughout the city, the PROS Plan and the Capital Improvement Program should be updated to adjust priorities and support accommodation of the needs in the station subarea. The City also will be exploring a potential park impact fee program and/or dedication program. New redevelopment projects will be required to provide public open space and recreation amenities.

Given that the anticipated increases in population would be expected to be manageable since they would occur over several decades, the City would have the ability to monitor growth over time and plan, prepare for, and secure resources to increase the level of parks, open space, and recreation facilities to serve the population as needed. Of particular importance will be the need to continually monitor opportunities to create neighborhood parks in the subarea.

3.4.3 Police, Fire, and Emergency Services

Shoreline is known region-wide for the effectiveness of its police force, and for programs that encourage troubled people to pursue positive activities and provide alternative treatment for non-violent and non-habitual offenders. Police protection in the subarea is provided by the Shoreline Police Department, King County Sheriff's Office, and Washington State Patrol. The Shoreline Fire Department provides fire protection and emergency medical services to the City of Shoreline. Servicing the community with fire suppression, prevention techniques, public outreach, and plan review and inspection services, they are committed to improving life safety and protection in Shoreline.

Affected Environment

Police Protection

The Police Station was built in 1956 and purchased by the City shortly after incorporation in 1995. The Station is located in the subarea at 1206 N 185th Street. The building is 5,481 square feet, and is constructed of unreinforced masonry that has not been retrofitted to earthquake standards. In 2012, the City initiated a feasibility study to analyze potential locations of a new facility. This need was identified during the City's 2009 Hazard Mitigation Planning effort.

As of 2014, there are 52 full-time employees assigned to the Shoreline Police Department. A majority of the officers are in the patrol division; additionally, there is a traffic unit, burglary-larceny detectives, special emphasis team (undercover) detectives, school resource officer, community services officer, professional support staff, sergeants, two captains, and a police chief. In 2012, the average response time to emergency calls for service for Shoreline Police was 3.39 minutes compared to the national standard of 5 minutes. Shoreline partners with the King County Sheriff's Office for specialized services, homicide/robbery investigations, SWAT, K9, air support, bomb technicians, and other services.

Police services are provided to Shoreline through a year-to-year "City Model" contract with King County in three major areas:

- City Services: staff is assigned to and works within the city. In 2012, there were 52 FTEs dedicated to the city.
- Regional Services: staff is assigned within the King County Sheriff's Office, and deployed to the city on an as-needed basis (e.g., criminal investigations and special response teams).
- Communications: The City contracts with King County for dispatch services through the King County 911 Communications Center.

There are no City-managed jail cells located within the city. The Shoreline Police maintain two holding cells at the Police Station on N 185th Street to detain suspects until they can be transferred to the King or Snohomish County jail facilities.

Special Emphasis Team (SET)—The Shoreline Police Department Special Emphasis Team (SET) consists of one

sergeant and four detectives. All four of the detectives are solely dedicated to the day to day operations of the SET Unit.

The responsibilities of the unit vary and are flexible to address identified crime trends in the city. This unit typically works in a plain clothes (undercover) capacity and drives unmarked cars to enhance surveillance abilities. The SET Unit has received extensive training in surveillance techniques, case development, interviewing techniques, and vice and narcotic investigations.

The Shoreline SET Unit works closely with other neighboring police agencies, local and state federal task forces, and the King County Sheriff's Office on a regular basis. SET detectives follow up on all narcotics and vice related complaints and arrests in Shoreline, and all Narcotic Activity Reports (NARs) generated from citizens.

The SET Unit is also actively involved with the Citizens Academies, Community Landlord Tenant Training, community meetings, and problem solving projects.

Criminal Investigations Unit—The Criminal Investigations Unit is comprised of one sergeant and four detectives. Three of the detectives are responsible for investigation and follow-up on most felony crimes committed in the city, with the exception of homicide/special assault and major accident investigations, which are handled by the King County Sheriff's Office Major Crimes Unit.

The fourth detective works exclusively on fraud and forgery investigations originating in Shoreline. This detective is also assigned on a part-time basis to a Secret Service Task Force. His participation in this task force brings extra support to the City of Shoreline for any complicated investigations that include counterfeiting of US currency, internet and computer investigations, and money laundering cases. Additionally, this detective also investigates Adult Protection referrals for financial exploitation of vulnerable adults in Shoreline.

Community Service Officer—The Shoreline Police Department has one Community Service Officer (CSO). The CSO provides non-law enforcement services to the community, relieving police officers of some tasks that do not require police legal authority.

The CSO's main function is that of community outreach. They are familiar with the various social services in the area and work closely with these agencies to provide needed services to citizens. They also work closely with the courts, domestic violence victims, and the Adult Protective Services concerning our adult vulnerable population.

Active Shooter and Patrol (ASAP) Teams--In the last decade, law enforcement on a national level has experienced a spike in violent, criminal behavior that has targeted vulnerable locations, such as schools, shopping centers, and movie theaters. The Shoreline Police Department has worked hard to develop and implement appropriate tactics by drawing on the expertise of multiple sources. They have designed a program that can be adjusted as needed to fit a wide range of scenarios. One of the highest priorities is partnership with the school district. The Shoreline Police Department strives to provide a safe environment for students.

Shoreline District Court (Non-City-Managed)—The Shoreline District Court, located at 18050 Meridian Avenue N, is supportive of police services provided to the City through an interlocal agreement with King County. The District Court provides City-managed court services for the prosecution of criminal offenses committed within the incorporated city limits. The District Court serves several other jurisdictions as well.

Police Level of Service

The Shoreline Police department strives to maintain the level of service of 1 patrol officer per 1,000 residents. In 2012 level of service was 0.99 commissioned officers per 1,000 Shoreline residents. The total number of commissioned officers includes full-time dedicated officers, plus officers who work in supervisory or other non-patrol related positions, as well as officers that work in specialty units that are on-call for the city. Although the number of Shoreline's dedicated officers may stay the same from year to year, the number of officers that respond to calls for service can change with the city's needs. Therefore, the number of total commissioned officers can increase or decrease depending on Shoreline's service needs from year to year.

Planned Police Facilities

The Police Department recently closed two storefront neighborhood centers that were staffed by community volunteers. Closing those facilities is associated with future plans to consolidate services into one facility. Scheduled for early 2016, the Police Department will close their precinct at N 185th Street and relocate to the Civic Center on the first floor of City Hall. Long-term plans include constructing a critical and essential infrastructure building for emergency related equipment, generators, and emergency communication systems.

Requests have been made for patrol officers to have available electric motorcycles that are environmentally friendly and quieter, which is beneficial when patrolling urban areas and parking structures. The department currently plans to achieve an approximate ratio of .85 commissioned officers per 1,000 residents (population) based on the City's adopted level of service standard/policy. The department reports it is currently operating at a ratio of approximately 1 commissioned officer per 1,000 residents.

Fire and Emergency Services

The Shoreline Fire Department is a non-City-managed service providing Fire Protection and Medical Emergency Services across an area slightly larger than the incorporated boundaries of the City of Shoreline. In the 2012 Comprehensive Plan, the Shoreline Fire Department estimated that the population served by the department is approximately 53,000. In addition to the Shoreline Area, the Fire Department provides fire suppression services to Point Wells in Snohomish County on a contractual basis. The Shoreline Fire Department maintains five stations located at 17525 Aurora Avenue N (Station 61), 719 N 185th Street (Station 64), 1851 NW 195th Street (Station 62-Children's Safety Center), 145 NE 155th Street (Station 65), and 1410 NE 180th Street (Station 63). The department also maintains five pumpers, three advanced life support units, three basic life support units, and one ladder truck. None of the stations are located within the subarea, however, Stations 61, 63, and 64 are adjacent to or within close proximity to the subarea.

The Fire Department currently employs twenty-nine full-time firefighter/paramedics who provide professional 24-hour advanced life support services. Station 61 has six command and

support staff and no operations officers. Station 63 has a minimum of four staff including one officer, two fire fighters, and one medical service officer. Station 64 provides a minimum staff of eight including one officer and two fire fighters on an engine, two fire fighters on an aid car, two paramedics, and a Battalion Chief. Station 65 has a minimum of three staff including one officer and two fire fighters. In addition, Shoreline Medic One staffs one full-time medic unit serving Northshore, Lake Forest Park, and Bothell.

Emergency medical services make up the largest number of 911-responses. Shoreline Fire Department provides two levels of medical care: Basic Life Support and Advanced Life Support. Firefighter/EMT's (Emergency Medical Technicians) and Firefighter/Paramedics provide a total team approach and provide distinct yet complementary care.

City of Shoreline Emergency Operations Center (EOC)—The City assumes responsibility of emergency management for their jurisdiction. The City has established its Emergency Operations Center at the Shoreline Fire Headquarters (Station 61) through a Memorandum of Understanding (MOU) signed by the City Manager and Fire Chief. The City supports the equipment needed to operate from the Fire Department's community room. The need for a more permanent EOC was also discussed in the 2009 Hazard Mitigation Planning process. This could potentially be included in the planning for a new police facility, and is considered a "critical facility" during emergencies.

Fire and Emergency Level of Service

The Shoreline Fire department determines their level of service by call volumes defining staffing and station demands and needs. The type of calls and location of the call relates to reliability or availability of the first due station to provide coverage. The department is operating at a very high level of service with about one call/incident annually for every 8 to 10 people. A typical level of service standard is approximately one call for every 30 people.

Planned Fire Facilities

The Shoreline Fire Department recently completed construction of two new neighborhood fire stations and a training/support services/administrative facility. Future projects are anticipated with expected population growth, but specific projects are not currently programmed. Station 63 is most likely to receive improvements since it is one of the older facilities and is designated as the first due station associated with the subarea. Improvements to this facility would provide an increase in response and allow for housing of appropriate equipment and response vehicles.

Analysis of Potential Impacts

Alternative 4—Preferred Alternative

For the higher level of population growth projection expected under Alternative 4—Preferred Alternative, at full build-out there would be a much higher demand for police protection as well as fire and emergency service facilities. Both the police and fire departments would require additional staff, equipment, and facilities to serve the growing population.

The total population would be expected to rise to 56,529 people living in 23,554 households under Alternative 4—Preferred

Alternative. This is 48,585 more people and 20,244 more households than under today's levels.

Full build-out under Alternative 4 would not occur by 2035. Based on market factors, property characteristics, and current population growth trends in Shoreline and the region, this level of growth would be anticipated to occur over many decades, not reaching build-out levels for 80 to 125 years (or by 2094 to 2139) or more.

There is the potential with increased population density that there could also be increases in crimes and offences in the subarea that would need to be addressed through added police protection and patrols.

The population growth of Alternative 4—Preferred Alternative would result in a demand for approximately 41 new commissioned police officers at full build-out (incrementally increasing over many decades up to that amount). With further evaluation and planning, the City could consider the potential for a satellite police station in the subarea over the long term future.

For fire and emergency services this population increase would result in an additional 4,859 to 6,089 calls annually at full build-out (again increasing incrementally over many decades up to that amount).

With the building heights and types proposed under Alternative 4 (as with Alternatives 2 and 3), there would be a need for emergency and fire service providers to evaluate current equipment and vehicles to determine if additional resources would be needed. For example, increased ladder height may be needed, and rescue and evacuation training needs may change.

Given the level of existing services and facilities compared to the potential future demand, additional funding and resources would be needed to support increases in the level of service provided by police, fire, and emergency services. Modern technology incorporated into new medium to high density developments is likely to increase efficiencies within the communication, call, and dispatch services within the subarea benefiting police, fire, and emergency services.

Because build-out would be expected to occur very gradually over several decades, it is anticipated that the service providers would be able to monitor growth in their activities, proactively plan for, and seek funding and resources to adjust services as needed to respond over time.

The Next Twenty Years (Up to 2035) for Any Action Alternative

Under any of the action alternatives, the projected 2035 population of new residents would be 2,916 to 5,399 (in 1,140 to 2,190 households), above the current number of residents and households in the subarea. This would create a demand for approximately 2.5 to 4.6 new commissioned police officers by 2035 (over today's levels) to address arising needs such as increased crimes and offences and to provide added patrol and protection services.

Fire and emergency service providers would need to increase staffing, equipment and facilities to handle approximately 292 to 675 new calls annually in the subarea by 2035.

Alternative 3—Previous Most Growth

For the level of population growth projection expected under Alternative 3—Previous Most Growth, at full build-out there would be a much higher demand for fire protection and emergency service facilities, equipment, and staff than under current conditions and under Alternative 2, but less than under Alternative 4. Based on current incidents/calls per population, an additional 2,937 to 3,671 calls per year would be expected with the population growth of 29,371 additional people.

Full build-out of Alternative 3—Previous Most Growth would impact the Shoreline Police Department facilities and services by creating an increased demand for approximately 25 additional commissioned officers to maintain the level of service ratio of .85 commissioned officers per 1,000 residents at full build-out. This staffing increase would help to address arising needs such as increased crimes and offenses and to provide added patrol and protection services.

Given the level of existing services and facilities compared to the potential future demand, additional funding and resources would be needed to support increases in the level of service provided by police, fire, and emergency services. Modern technology incorporated into new medium to high density developments is likely to increase efficiencies within the communication, call, and dispatch services within the subarea benefiting police, fire, and emergency services.

Because build-out would be expected to occur very gradually over several decades (60 to 100 years or longer; by 2075 to 2115 or beyond), the service providers would be able to monitor growth in their activities, proactively plan for, and seek funding and resources to adjust services as needed to respond over time.

Alternative 2—Some Growth

For police protection, with a total population of 17,510 persons projected for the subarea, 9,566 over the current population of 7,944, approximately 8 additional commissioned officers would be needed at build-out to address arising needs such as increased crimes and offences and to provide added patrol and protection services.

It would be expected that new developments would include modern technology that would likely increase efficiencies within the communication, call, dispatch services, and security systems related to needs within the subarea.

Fire protection and emergency services facilities, equipment, and staff also would be needed with the increased population. The current rate of one incident call for every 8-10 people applied to the additional population of 9,566 may impact fire protection and emergency services by 957 to 1,196 additional calls per year. Similar to police protection, it would be expected that modern technology incorporated into new medium to high density developments would likely increase efficiencies within the communication, call, and dispatch services related to needs within the subarea.

Given the level of existing services and facilities compared to the potential future demand, additional funding and resources would be needed to support increases in the level of service provided by police, fire, and emergency services. Service providers would need to evaluate current equipment and vehicles to determine

when additional resources, such as increased ladder heights and/or rescue and evacuation training, should be added.

Because build-out under Alternative 2—Some Growth would be expected to occur very gradually over several decades (30 to 50 years or longer; by 2045 to 2065 or beyond), the service providers would be able to monitor growth in their activities, proactively plan for, and seek funding and resources to adjust services as needed to respond over time.

Alternative 1—No-Action

Under the Alternative 1—No Action, population growth and construction of new housing and businesses in the study would be less than under the action alternatives, but there would still be some additional demands for police, fire, and emergency services. Under the No-Action Alternative, the City's population growth would impact fire protection with an estimated total population in the subarea of 8,734, an increase of 790 people over the current population of 7,944.

For police protection, Alternative 1—No-Action would increase demand for police, fire, and emergency services. Related to police services, if Shoreline Police maintained the level of policy standard ratio of .85 commissioned officers per 1,000 residents, the additional population would require approximately one additional commissioned police offer. Additional impacts may be incurred depending on the involvement and future continued support by the King County Sheriff's Department.

Redevelopment under the No-Action population increase is less likely to include advanced technology to support emergency service and security systems in connection with the dispatch service.

For fire and emergency services, the population increase would equate to an additional 79 to 99 calls/incidents annually. With the fire and emergency services already under a substantial burden to serve the current population and responding to three times more calls than typical service levels, any increases in population would require additional services and facilities.

Mitigation Measures

- The demand for police protection could be reduced through requirements for security-sensitive design of buildings and Crime Prevention through Environmental Design (CPTED) principles for surrounding site areas.

- Additionally, provisions of onsite security services could reduce the need for police protection, and revenues from increased retail activity and increased property values could help offset some of the additional expenditures for providing additional officers and response to incidents.

- The Fire Department places a lot of emphasis on fire prevention tactics and community education to reduce unintentional injuries and the loss of life and property from fire, accidents, and natural disasters by increasing public awareness.

- Implementation of advanced technology features into future development could increase response time and improve life safety in emergency situations.

- Behavioral changes through education and increased use of outreach, as well as volunteer services such as neighborhood watch programs also could help to reduce demand for some services.

- The increases in households and businesses in the subarea will result in increased tax revenue, which could help to offset some of the additional costs associated with providing increased services and the need for additional facilities related to police, fire, and emergency services.

- With further evaluation and planning, the City could consider the potential for a satellite police station in the subarea over the long term future.

Significant Unavoidable Adverse Impacts

There would be an increase in demand on police, fire, and emergency services under any of the alternatives, but to more substantial levels under Alternative 4—Preferred Alternative and Alternative 3—Previous Most Growth than under Alternative 2—Some Growth and Alternative 1—No Action. With increased population there would likely be an increase in crime, as well as in emergency incidents that require more service from police, fire, and emergency professionals.

Because the growth under any of the action alternatives would be expected to occur gradually, over many decades, department and district planning for services and facilities should be able to proactively plan for and keep pace with the growth to allocate resources (staffing, buildings, equipment, etc.). However, there is a concern particularly related to fire and emergency services that funding levels may not be sufficient for the department to maintain the level of service required to respond to increased calls.

Police Protection has been able to manage an acceptable industry level of service for years and plans to continue achieving that service standard during population growth. However, increased population or other changes in the community may require alteration of specific unit development within the Police Department or may require changes in support from the King County Sheriff's department or Washington State Patrol.

Adequate funding for provision of services, as well as procurement of equipment and resources would need to be allocated over time to support population growth in the subarea. With this investment it is anticipated that potential adverse impacts would be mitigated, and there would not be significant unavoidable adverse impacts.

3.4.4 Solid Waste Management Services

Affected Environment

City Contracted Services through Recology Cleanscapes

Solid waste, recycling, and food scraps and yard waste collection services in Shoreline are provided under contract with Recology Cleanscapes. Typically the solid waste and recycling services are contracted by the City of Shoreline for a period of seven years, but the contract timeframe can vary depending on the specific

service and contracting agency. Residential customers receive curbside garbage collection every week. Recycling and food and yard waste collection occurs every other week. The schedule for collecting recycling is offset from the food and yard waste collection week. Recology Cleanscapes will haul bulky waste items (e.g. refrigerators, sofas, mattresses, etc.) curbside for an additional charge. After collection the solid waste is transported to the King County Recycling and Transfer Station in Shoreline. The food and yard waste is taken to Lenz Recycling Compost Facility in Stanwood, Washington. The recycling materials are transported Recology Cleanscape's own materials recycling facility in Seattle, Washington.

King County Solid Waste Division

A King County Recycling and Transfer Station is located at 2300 N 165th Street. This facility receives solid waste and a variety of recycling materials from the Shoreline community and surrounding cities. The Shoreline Transfer Station accepts large appliances and fluorescent light bulbs, which aren't disposable at other area facilities. Waste consolidated at the transfer station is hauled to the Cedar Grove Regional Landfill in Maple Valley, Washington.

The King County Comprehensive Solid Waste Management Plan completed in 2013 provided an estimate of the amount of waste generated per customer (household or commercial address) and the recycling rate for communities in the county. For Shoreline, the average amount of garbage disposed per week was 23 pounds per customer. This was lower than many other communities in the county and lower than the countywide average of 25 pounds per week. Shoreline's recycling level was 57 percent, which was higher than many other communities and higher than the countywide average of 55 percent. The Shoreline community is managing solid waste in an above average manner. Also, in Shoreline and countywide, average weekly disposal amounts are trending downward, while recycling levels are increasing.

Analysis of Potential Impacts

Under all the alternatives, population increase in the subarea would increase demand for solid waste, recycling, and food and yard waste collection services over the course of the time the population reaches build-out levels.

Under Alternative 4—Preferred Alternative, an additional 23,554 households, as well as various businesses and other land uses would develop over time and create increased demand for services in the subarea. Alternative 4 would create more demand than under the other two action alternatives.

Under Alternative 3—Previous Most Growth, an additional 12,238 households, as well as businesses and other land uses would develop over time.

Under Alternative 2—Some Growth, an additional 3,986 households, as well as various businesses and other land uses, also would develop over time and create increased demand for services in the subarea.

Under Alternative 1—No Action, the demand for additional solid waste services would be expected to be minimal, covering the need of 329 additional households and businesses in the subarea.

Table 3.4-4 on the following page displays estimated waste generation levels per alternative based on today's known calculations for Shoreline. It should be noted that these amounts are likely high given trends toward solid waste reduction and increased levels of recycling.

Table 3.4-4
Solid Waste Generation per Alternative

Time Frame	Alt. 4 Preferred Alternative	Alt. 3 Previous Most Growth	Alt. 2 Some Growth	Alt. 1 No Action
Twenty Years/ 2035	32,813 to 60,739 total pounds per week of solid waste generated	32,813 to 60,739 pounds per week of solid waste generated	32,813 to 60,739 pounds per week of solid waste generated	5,914 additional pounds per week of solid waste
Build-Out	599,779 total pounds per week of solid waste generated	537,341 total pounds per week of solid waste generated	171,533 total pounds per week of solid waste generated	Not Analyzed

More landfill space may be needed to support waste management at the levels listed, particularly for Alternatives 4 and 3. There would need to be intense management of solid waste levels including actions to divert waste to avoid this outcome.

Mitigation Measures

As discussed previously in this section, full build-out of the action alternatives would be expected to occur gradually, over many decades into the future. As a contracted public service, the City would need to allocate additional funding to solid waste services to serve the growth in population. It is anticipated that increases in households and businesses in the subarea would result in increased tax revenue, which could help to offset some of the additional costs associated with providing increased solid waste services.

- To reduce construction related waste, the City could require development applicants to consider recycling and reuse of building materials when redeveloping sites, and as part of their application require them to explain what measures are included.
- The City may condition Planned Action applications to incorporate feasible recycling and reuse measures.
- Using solid waste, recycling, and food and yard waste collection storage and container size requirements would mitigate impacts associated with all of the alternatives.
- Currently the City of Shoreline hosts two recycling events typically in the fall and the spring. These events provide a place for homeowners to recycle materials commonly not collected at the curb. With population growth, increasing the number of events per year could mitigate additional demand on the recycling collection vendor.
- The City or other entities involved in solid waste management could increase outreach to educate

residents and businesses about the importance of waste reduction and recycling. Programs to encourage more composting, conversion of waste to energy, reuse, recycle, barter/trade, etc. could be intensified over time. These efforts could lead to behavioral shifts in the subarea that might then help offset some of the increased demand for services.

- Solid waste services are paid through fees. Additional customers would increase the revenue base for solid waste management services. In addition, the City and its contractor could manage the fee structure and potentially increase fees in the future if needed to address the additional demand for services. It is anticipated that this would be a last resort if outreach and education do not result in reduced solid waste levels.

- The City would work with King County and regional waste management entities to monitor the ongoing potential need for additional landfill space.

Significant Unavoidable Adverse Impacts

Implementation of any of the action alternatives would increase demand for solid waste services due to increases in residential and employment population in the subarea. With additional budget allocation to contracted services supported by increased tax revenue from new households and businesses over several decades, the increased demand for services would be addressed. As such, no significant unavoidable adverse impacts would be anticipated.

3.4.5 Other Public Services and Facilities

Affected Environment

City Hall/Shoreline Civic Center/City Services

The Shoreline Civic Center and City Hall are located at 17500 Midvale Avenue N in the heart of Shoreline's Town Center. This new facility is a 67,000 square feet, LEED Gold certified building with an expected lifespan of 50-100 years. It offered the ability for the City to consolidate services to one location, and will further that goal to better serve the community by welcoming the new police department in the near term. City Hall currently includes the Executive, City Clerk, Attorneys, Finance, Administrative Services, Human Resources, Parks and Cultural Services, Public Works, and Planning and Community Development. City Hall has a count of 135 FTEs. The current level of service for the City calculates to approximately 2.52 employees per 1,000 residents. If the City assumes additional responsibilities in the future, such as jurisdiction over utility systems, this ratio could change with more employees per 1,000 residents.

Historical Museum/Arts and Culture

The Shoreline Historical Museum is located just outside the subarea at the intersection of N 185th Street and Linden Avenue N. It is managed and operated by a non-profit organization with a mission dedicated to preserving, recording, and interpreting the heritage of the historic Shoreline area and its relationship to the Northwest region.

Various arts and cultural groups are active in the community and provide a variety of community services.

Libraries

The Shoreline Library is a King County District Library located in the subarea at 345 NE 175th Street. It is a 20,000-square-foot facility opened in 1993, replacing the 15,000-square-foot library built in 1975, and offers additional features that the recent previous facility did not include, such as two meeting rooms and two study rooms.

Postal Buildings

A United States Postal Service Office is located in the subarea at 17233 15th Avenue NE. This North City Post Office has full service capabilities for the surrounding community with hours from 8:30 – 5:30 Monday through Friday, and open from 8:30 to 3:00 on Saturdays. The lobby area is open 24 hours for PO Box access, mail drop off, and other self service features. The demand for postal services has been in general decline in the US for several years due to the reliance of the public on other communication methods such as email services and social media.

Human and Social Services

A Washington Department of Public Health Laboratory is located in Shoreline at 1610 NE 150th Street. The location is outside the subarea, but provides diagnostic and analytical services for the assessment and surveillance of infectious, communicable, genetic, and chronic diseases, and environmental health concerns to the surrounding community. Other types of human services provided in Shoreline include services for seniors such as the senior center and social service programs and facilities. Social and community services would include the need for community center uses, additional meeting space, and other facilities.

Analysis of Potential Impacts

City Services

Population growth under all of the alternatives would increase demand for City services, but more so with the action alternatives, and in particular with Alternative 4—Preferred Alternative or Alternative 3—Previous Most Growth. Redevelopment over time would necessitate ongoing needs for new regulations, planning and development review, and capital projects, as well as City Public Works, Parks and Recreation, maintenance personnel, and other staff and resources. Based on the additional population growth anticipated under the various action alternatives, the following increases in demand for other types of public and community services would be expected.

Alternative 4—Preferred Alternative would result in addition of 48,585 people. This level of new population would generate demand for:

- 122 additional full-time-equivalent (FTE) City employees at build-out (incrementally increasing over many decades up to that amount), applying the current ratio of 2.52 city employees per 1,000
- 88.7 percent increase in demand for other services such as library, museum, arts and culture, postal, and human/social services (a new library or satellite library may be needed at build-out)

The Next Twenty Years (Up to 2035) for Any Action Alternative would add 3,418 to 6,327 more people to the subarea. This level of new population would generate demand for:

- 7.35 to 13.61 additional FTE City employees
- 5.3 percent to 9.9 percent increase in demand for other services such as library, museum, arts and culture, postal, and human/social services

Alternative 3—Previous Most Growth would bring an additional 29,371 people to the subarea. This level of new population would generate demand for:

- 74 additional FTE City employees at build-out
- 53.6 percent increase in demand for library, museum, arts and culture, postal, and human/social services (a new satellite library may be needed)

Alternative 2—Some Growth would increase population by an additional 9,566 people, which would generate demand for:

- Additional 24 FTE City employees at build-out
- 17.5 percent increase in demand for library, museum, arts and culture, postal, and human/social services

Alternative 1—No Action would have an estimated population increase of 790 people by 2035 and would generate demand for:

- Two additional FTE City employees would be needed to serve this growth
- Minimal increased demand for library, museum, arts and culture, postal, and human/social services

Mitigation Measures

All alternatives would increase population in the subarea and require additional public services, including the need for a variety of services. For all public services, it is anticipated that increases in households and businesses in the subarea would result in increased tax revenue, which could help to offset some of the additional costs associated with providing increased services and facilities to serve the growing population. Also, because growth would happen gradually over many decades, it is anticipated that the demand could be monitored, planned for, and served in a manageable way over time.

- The City may consider increases in development application review fees to cover costs associated with increased redevelopment activities in the subarea.

- The City should continue to provide outreach and communication to other public service entities listed above to make them aware of the potential for growth over time and the gradual increased demand for services that may accompany the growth.

- The City and other human/community services providers should monitor the need for additional services and facilities as growth occurs over time, and properly plan for and allocate resources toward expanding and enhancing services to address increased demand.

Significant Unavoidable Adverse Impacts

Under all alternatives, the subarea would experience population growth. Under Alternative 4—Preferred Alternative, this growth would be more substantial than under Alternative 1—No Action or Alternative 2—Some Growth. Alternative 3—Previous Most Growth would also increase population to substantial levels (more than Alternatives 1 and 2 but less than Alternative 4). The relative incremental pace of growth would be expected to be similar under any of the action alternatives, occurring gradually, over many decades. The City and service providers would have opportunities to monitor growth, update plans, and prepare for and respond appropriately with additional services to accommodate the increased demand. As such, no significant unavoidable adverse impacts would be anticipated.

3.5 Utilities

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures related to utilities, including water, wastewater, surface water, electricity, natural gas, and communications.

3.5.1 Affected Environment

3.5.1 a Water

Service Providers

Two water purveyors offer service in Shoreline: North City Water District and Seattle Public Utilities. Water service in the subarea is split, with Seattle Public Utilities serving the western half, and North City Water District serving the eastern half. A map of the water service area is provided as **Figure 3.5-1.** Note all maps are provided at the end of this section.

Water Supply

North City Water District

North City Water District along with sixteen other water utility districts purchase water wholesale from Seattle Public Utilities. In January 2012, North City Water District completed a new connection with the Seattle Public Utilities NW regional supply, which draws water from both the Tolt and Cedar River Watersheds. The Tolt Watershed acts as the main water supply for the North City Water District, with the Cedar River Watershed as a newly acquired backup water source.

The Tolt River Watershed is located in the foothills of the Cascades in East King County. It supplies about 30 percent of the drinking water for 1.4 million people in the greater Seattle area. The Tolt Reservoir captures water and snow from the Tolt watershed.

The City of Seattle's Cedar River Municipal Watershed is managed to supply drinking water to 1.4 million people in the greater Seattle Area.

The North City Water District contains seven pressure zones. Half of the subarea is located within the 590 pressure zone, the largest zone within the city. In 2013, the North City Water District entered into a new agreement with the Seattle Public Utilities to supply 3,330 gallons per minute (gpm) of water to its customers. In conjunction with the new withdraw rate, The North City Water District conducted an analysis of water currently available to customers within their system. **Table 3.5-1** contains an analysis of their existing and projected water supply demands for the water source feeding pressure zone 590, and all other zones associated with this source.

As indicated in Table 3.5-1, under the North City Water District's current demand projections (estimated growth without the inclusion of the 185th Street Station Subarea Rezoning Option), the District will have a surplus of 882 gpm under peak demands for the year 2030. According to the North City Water District 2011 Comprehensive Plan, the District does not currently forecast to have a deficiency in source capacity through the year 2030.

Table 3.5-1—Water Source Analysis

Year	ERUs[1]	MDD[2] (GPM)	FSS[3] Replenishment Rate (GPM)	Source (GPM)		
				Required	Existing/Proposed	Surplus (Deficit)
2013	7,745	1,836	250	2,086	3,330	1,244
2016	7,977	1,891	250	2,141	3,330	1,189
2030	9,275	2,198	250	2,448	3,330	882

1. ERU = Equivalent Residential Unit is used to convert commercial units and multifamily dwellings to equivalent single family residential units for water demand forecasting purposes
2. MDD = Max Daily Demand
3. FSS = Fire Suppression Storage

Seattle Public Utilities

The Seattle Public Utilities is the primary water purveyor in the area. In addition to the City of Shoreline, SPU services the City of Seattle, and a number of communities and wholesale water purveyors within King County and southern Snohomish County. Seattle Public Utilities current supply estimate is 172 million gallons per day (mgd). Based on Seattle Public Utilities Comprehensive Plan, SPU's source of supply is adequate for demand forecast until 2060.

Water entering the distribution system from the SPU's water sources is treated at a number of treatment facilities. Current water quality readings are adequate for the water system at various water quality sampling locations. In the future, SPU will be evaluating contract extension options for the Tolt and Cedar Water Treatment Facilities.

Water Storage

North City Water District

The North City Water District owns two reservoirs in the area. The reservoirs contain 5.7 million gallons of water collectively. The largest of the storage facilities contains 3.7 million gallons of water storage. This reservoir directly serves the pressure zone in which the subarea is located. The 2011 North City Water District's Comprehensive Plan performed an analysis on this reservoir, and determined it has adequate capacity for the 2030 forecasted demand scenario.

Table 3.5-2 contains a summary of the water storage available to the system in millions of gallons (MG) for Equivalent Residential Units (ERU). An ERU is a unit of measure used to equate non-residential or multi-family residential water usage to a specific number of single-family residences. For example, if a system has sufficient physical capacity to serve 100 ERU's, then that system would have sufficient capability to meet the projected needs of 100 full-time single-family residences. That same system would

also be able to serve any combination of customers (residential, commercial, etc.) provided the quantity of water used is equivalent to the projected needs of 100 single-family homes (100 ERUs).

Table 3.5-2—Water Storage Analysis

Year	ERUs	Grouped Zone Gross Vol. (MG)	Storage Component Volume (MG)					Effective Volume (MG)[5]	Storage Surplus (Deficit) (MG)[6]
			Dead Storage[1]	Standby Storage[2,4]	Fire Suppression Storage[3,4]	Equalizing Storage	Operational Storage		
2016	7977	3.7	0	2.72	1.08	0.16	0	3.7	0.82
2030	9275	3.7	0	3.17	1.08	0.23	0	3.7	0.3

1. Dead Storage includes the stored volume that is not available to all customers at a minimum design pressure. The construction and operation of the North City Pump Station will make use of the dead storage in the 3.7 MG reservoir.
2. Standby Storage determined by Department of Health (DOH) recommendation to provide storage for two days of the system's average day demand (ADD). DOH recommends at a minimum, 200 gallons/ERU.
3. Fire Suppression Storage is a volume available at a minimum pressure of 20 psi to all customers and includes the volume consisting of the highest minimum required fire flow rate and duration.
4. Standby and Fire Suppression Storage are consolidated (nested).
5. Effective Volume is the total volume of the reservoir less any dead storage.
6. Storage Surplus is the Effective Volume, less the larger of the Standby and Fire Suppression Storages, less the Equalizing Storage.

In addition to the reservoirs, the North City Water District contains four source withdrawals and two booster pump stations that work in conjunction to supply water to its customers. The Tolt Booster Station 1 has a capacity of 2,000 gpm with alternating pumps, and Tolt Booster Station 2 has a capacity of 2,300 gpm with alternating pumps.

In 2013, the North City Water District installed a fourth supply station into their network. With the two booster pump stations, the new supply station, and 3.7-million-gallon reservoir, the District projects to have adequate water storage capabilities for the forecasted demand of 2,448 gpm in year 2030.

Seattle Public Utilities

The Seattle Public Utility District owns and operates a number of water storage facilities within the City of Shoreline. The subarea is primarily serviced by the Lake Forest Park open reservoir, which contains 60 million gallons of available water storage. A $31-

million project was completed in 2002 to cover the Bitter Lake and Lake Forest reservoirs, both of which serve areas within the Shoreline city limits. Seattle Public Utilities is currently in the process of replacing a number of existing surface reservoirs with underground structures. In 2020, the floating covers on Bitter Lake and Lake Forest Park Reservoirs will be evaluated for their remaining service life and possible replacement.

Modeling of the water conveyance system has verified that the Lake Forest Park reservoir is currently adequately sized for the population. No upsizing of the reservoir is projected in the near future.

Water Distribution

North City Water District

According to the North City Water District's Comprehensive Plan, over 50 percent of the District's mains were installed between 1966 and 1968. The North City Water District's distribution and transmission main inventory identified approximately 10 percent of their network as 4" mains or less, 54 percent as 6" mains, 35 percent as 8" to 12" mains, and less than 3 percent as larger than 12" mains. In order to ensure adequate fire flow within the system, when a new development is constructed, they are required to upsize all public water mains adjacent to their development to a minimum 8" diameter to provide adequate fire suppression.

In order to ensure adequate fire flow within the system, prior to starting a new development, an applicant is required to apply for a Certificate of Water Availability. Once the application is complete and the fees paid, the District will conduct a Fire Flow Analysis using a computer hydraulic model to determine the amount of flow and pressure available at the property in question. If the result of the analysis indicates there is sufficient fire flow, the Certificate of Water Availability will be issued to the property owner. If the result of the analysis indicates there is insufficient fire flow, improvements will be required.

The majority of water mains within the North City Water District's portion of the subarea are 6" diameter mains. A series of 12" mains run along 12th Avenue NE, from NE Serpentine Place to NE 180th Street, then north along 10th Avenue NE. A 10" diameter main crosses I-5 and runs down 5th Avenue NE, servicing approximately 100 customers on the west side of I-5. No mains within the North City Water District portion of the subarea are less than 6" in diameter.

Seattle Public Utilities

Pipe diameter ranges from 2" distribution mains to 30" transmission mains within the subarea. Within the Seattle Public Utilities region of the subarea, there are 7,200 feet of water mains less than 6" in diameter, 23,800 feet of water mains between 6" and 12", and 10,300 feet of water mains greater than 12". A 30" water transmission main runs along NE 185th Street, between the primary 66" supply main from the Lake Forest Park water reservoir and Aurora Avenue N. The 30" steel transmission main was installed in 1955, and is approaching the end of its serviceable life.

Current Demand for Water

Residential water demand is based on a survey generated by Seattle Public Utilities regarding wholesale water customers. The study includes the North City Water District residential demand per household. A comparison of residential water demand for the North City Water District, Seattle Public Utilities District, and Seattle's Wholesale customers is shown in **Table 3.5-3**

For the purposes of this analysis, the average water consumption of 171 gpd per single family residential household will be used for the residential demand calculations. Commercial water use is based on Equivalent Residential Units (ERUs), with 171 gpd per ERU. For the purposes of this study, 1 ERU is equivalent to 2.4 employees.

Table 3.5-3—Water Consumption Analysis

	2008	2009	2010	2011	2012
North City Water District	169	171	171	140	139
Wholesale Average	179	193	164	165	172
Seattle	140	145	145	128	130

With these demand figures, the North City Water District supplies 358,288 gpd of water during peak season operations to their portion of the subarea, and Seattle Public Utilities supplies 310,892 gpd to their portion of the subarea. The total demand within the subarea under current conditions is estimated to be 669,180 gpd.

Fire Flow

According to Seattle Public Utilities (SPU), all fire hydrants were tested in their section of Shoreline in 2012. The "Modeled ADD Fire Flow in Shoreline August 30, 2012" map depicts the available fire flow in the SPU region of the city. According to the map, the subject area is within the 590 feet of elevation pressure zone. Current fire flow for the area ranges in pressure from 2,000 gpm to over 4,000 gpm. Two fire hydrants within the subarea currently operate between 1,000 and 2,000 gpm. An area south of the subarea on N 175th Street contains nine hydrants operating with a flow between 1,000 gpm and 2,000 gpm.

3.5.1.b Wastewater

Service Provider

The City of Shoreline is served by the Ronald Wastewater District. The Ronald Wastewater District is currently a municipal utility governed by elected officials. A joint merger between the City of Shoreline and the Ronald Wastewater District is currently being evaluated, which would make the wastewater system a City owned and operated utility.

The subarea is located within five sewer drainage basins, and is served by three lift stations owned and operated by the Ronald Wastewater District. The majority of the wastewater flows to the southeast through a series of pipes ranging from 15" to 30" in diameter. A map of the wastewater lines in the subarea is provided as **Figure 3.5-2** at the end of this section.

Wastewater Treatment Facilities

Wastewater collected from the Ronald Wastewater District is treated at two separate treatment facilities, King County's West Point Treatment Plant and the City of Edmonds Treatment Plant.

King County's West Point Treatment Plant treats wastewater from homes and businesses in Seattle, Shoreline, North Lake Washington, North King County, and parts of South Snohomish County. The treatment plant treats 90 million gallons per day (mgd) of sewage during the dry months, and up to 440 mgd during the rainy season. The Ronald Wastewater District currently pays King County based on the number of residential customer equivalents within the District, which are tributary to the West Point Treatment Plant. There is currently no cap on the amount of wastewater the Ronald Wastewater District is allowed to discharge to the West Point Treatment Plant. Currently an estimated 3.82 mgd of wastewater is transported from the Ronald Wastewater District to the West Point Treatment Facility.

The City of Edmonds Wastewater Treatment Plant treats wastewater from the cities of Edmonds, Mountlake Terrace, and Lynnwood; as well as parts of King County; Olympic View Water and Sewer District; and Ronald Wastewater District. On average, the City of Edmonds Wastewater Treatment Plant treats 5.6 mgd of wastewater. The District pays the City of Edmonds based on the actual volume of wastewater discharged to the Edmonds Treatment Plant. Due to monitored flow rates, Ronald Wastewater District pays not only for customer wastewater generation, but also infiltration and inflow (I/I) that leaks into their system from high groundwater tables and unmonitored connections within the system. On average the Ronald Wastewater District discharges 0.33 mgd of wastewater to the Edmonds Treatment Plant and has a treatment capacity daily limit of 0.861 mgd.

Water Reclamation

Reclaimed wastewater is a way to reduce wastewater discharge, as well as reduce potable water demand. Treated wastewater effluent can be distributed back to the communities for non-potable uses, such as industrial water use, landscaping, and flushing toilets. Treated wastewater is never reused for drinking purposes.

Typically reclaimed water is transported through a network of "purple pipes." The cost of building infrastructure to move water from reclaimed water plants to customers is one of the most significant challenges to the distribution and use of reclaimed water. Legislative approval is needed for an expanded grant program to fund reclaimed wastewater treatment and transportation.

King County made reclaimed water available for on-site industrial processes and landscape irrigation at two wastewater treatment plants in 1997. King County's current reclaimed water program produces 284 million gallons of Class A reclaimed water per year at these two regional wastewater plants. A portion of the wastewater produced within the subarea is transported to the West Point Treatment Plant, which has the potential to produce up to 0.70 mgd of Class A reclaimed water from an average capacity of 133 million gallons per day.

Seattle Public Utilities performed a study on the viability and cost analysis of installing a new and much larger reclaimed water distribution system from the Brightwater Treatment Facility, which went online in 2011. The analysis examined the benefits and disadvantages of installing reclaimed "purple pipes" to facilities in North Seattle and Shoreline. The study analyzed potential commercial customers which could benefit from reclaimed water. The study identified 60 potential reclaimed water customers divided into five categories within the North Seattle and Shoreline communities:

Golf Courses	4
Cemeteries	7
Parks	19
Schools	20
Other	7
Total	60

It was estimated that the full life-cycle cost of building and operating a distribution system to deliver reclaimed water from the Brightwater Treatment Facility to potential customers in North Seattle and Shoreline would be about $109 million.

The potential benefits of this reclamation project were found to be minimal. Calculations showed that the project would reduce peak season demand from Seattle's regional water supply system by up to 0.7 mgd. By itself, this amount is too small to have a detectable positive impact on regional water supply, reliability, or environmental conditions in the Cedar River and Tolt River. The project would reduce the peak season withdrawals of self-supplied irrigators from their own local supplies by up to 1-mgd. This might provide small improvements in habitat conditions for several streams in the area, though it would not be expected to result in significant increases in biological productivity. The project would reduce the discharge of pollutants from King County treatment plants into Puget Sound by about 0.04 percent.

Although the analysis determined that a purple pipe distribution system would not be cost effective to serve a large number of relatively small customers, dispersed over a large area, as areas redevelop, this type of system could become more cost effective. Other alternatives are currently being pursued to minimize wastewater discharge and reduce water consumption in the area. Currently, the two existing water reclamation facilities are the only facilities in operation. There could be the potential to introduce future water reclamation facilities within the King County wastewater system. However, this is not currently being actively pursued.

The City of Shoreline should coordinate with service providers to monitor advancements in water reclamation systems regionally on an ongoing basis in the future, and to determine opportunities to use these systems with new development/redevelopment as feasible. The potential to convert existing systems also should be evaluated with advancements in the use of this technology in the region over time.

Wastewater Collection Systems

The subarea contains 80,700 feet of mains between 6" and 12", and 370 feet of mains larger than 12".

The primary sewer basin collects wastewater flowing south, concentrating the flow along NE Serpentine Place to NE 175th

Street. The network of pipes that connects to this discharge point ultimately connects to the King County's West Point Treatment Plant further down the system.

The second main discharge location is to the north along 5th Avenue NE. The network of pipes that connects to this discharge point also ultimately connects to the King County's West Point Treatment Plant.

The Ronald Wastewater District contains primarily gravity sewer mains within the subarea. However, due to topography, a few areas within the subarea are serviced by sewer lift stations. **Table 3.5-4** contains a summary of the sewer lift stations currently servicing a portion of the subarea.

Table 3.5-4—Ronald Wastewater District Lift Stations

Station #	Location	Pump Type	GPM @ Head
8	1208 NE 201st St	Wetwell/Drywell w/ Standby generator	100 gpm @ 39 ft
14	343 NE 178th St	Wetwell/Drywell	240 gpm @ 37 ft
15	18349 10th Ave NE	Wetwell/Drywell w/ Standby generator	550 gpm @ 120 ft

Current Demand

The wastewater demand for the City of Shoreline is based on a study performed by CHS Engineers, LLC for the Ronald Wastewater District's 2010 Comprehensive Plan. Residential wastewater generation is estimated at 85 gpd per person. Commercial wastewater generation is estimated at 187 gpd per Equivalent Residential Unit (ERU) with 2.4 employees per ERU. Based on these generation quantities, the average daily wastewater demand within the subarea under current conditions is estimated at 788,063 gpd.

3.5.1 c Surface Water

Service Provider

The City of Shoreline owns and maintains its own surface water collection system. The City of Shoreline Surface Water Master Plan (adopted in 2005 and updated in 2011) outlines the surface water management program adopted by the City.

Drainage Basin

The City of Shoreline contains seven drainage basins, to which surface water facilities discharge. The subarea drains to two of these drainage basins.

Thornton Creek

The south and western half of the site drains to the Thornton Creek Basin. The Thornton Creek Basin drains approximately 2,418 acres in the southeast quarter of the City of Shoreline. The basin is almost completely developed, with only about 3-percent of the basin remaining as vacant or open space. Land use in the basin is primarily single-family residences and roads. Commercial areas are the next most prevalent land use type, followed by institutional uses. Currently, there is a relatively small amount of

multifamily use or apartments. Since I-5 intersects this basin, it and the resulting connector streets and on/off ramps contribute a large volume of impervious surface runoff to the basin.

The Thornton Creek drainage system contains primarily piped and channeled surface water conveyance within the City of Shoreline. There are very few natural water courses remaining in the upper basin due to development. Many wetlands and hydraulically sensitive areas have been altered or filled in this drainage basin, dating back to the 1950s and 1960s. Very few natural infiltration or surface water storage facilities remain in this basin to assist with peak flow demands.

Over the years, urbanization of the drainage basin without mitigation to address runoff impacts has increased erosion and sedimentation within the creek, due to increased peak flows. This includes activities such as building homes without adequate drainage systems, filling in drainage ways, and construction without sufficient erosion control measures.

The subarea drains into two of the main sub-basins for Thornton Creek. The majority of the subarea portion that discharges to Thornton Creek ultimately discharges to Ronald Bog. The north branch of Thornton Creek's main stem begins near the intersection of 180th Street and Corliss Avenue. This drainage flows through piped water courses into Ronald Bog, a 7.7-acre pond that was previously a peat bog. Outflow from the pond is regulated by a 30-inch diameter pipe extending over 1,000 feet. This pipe is at a reverse grade and contributes to flooding into the area immediately south of Ronald Bog.

The remaining southeastern portion of the subarea, which discharges to Thornton Creek, ultimately discharges to Littles Creek. Littles Creek flows south along the east side of I-5 to Thornton Creek. The tributary originates as a piped system near NE 174th Street and 14th Avenue NE, near the southeastern corner of the subarea. This sub-basin collects drainage from mostly residential areas. A retention pond with a pumped overflow at the southwest corner of 170th Street NE and 15th Avenue NE drains to Littles Creek. A piped water course carries drainage from Paramount Park to the tributary. The tributary then passes through the Paramount Park Open Space, which has a 6.9-acre wetland system and two open water ponds.

McAleer Creek

The north and eastern portions of the subarea drain to McAleer Creek. Within the City of Shoreline, surface water enters McAleer Creek Basin in three ways: through a piped network of tributaries to Echo Lake, which in turn drains into Lake Ballinger; through piped networks discharging directly into Lake Ballinger; and through piped networks discharging to either McAleer Creek or one of its tributaries. The portion of the McAleer Creek Basin within the city totals approximately 1,322-acres. Land use in the McAleer Creek Basin is predominantly residential, although there is a moderately large commercial/industrial section along the Aurora Avenue N corridor. There are small areas of schools, parks, open space, and a cemetery which drain into McAleer Creek. Roads make up the largest impervious area in the basin.

The headwaters of McAleer Creek begin in the Hall's Creek and Echo Lake watersheds, both of which drain into Lake Ballinger. McAleer Creek begins at Lake Ballinger's outlet and flows through the City of Mountlake Terrace, the City of Shoreline, and the City

of Lake Forest Park. The main stem of McAleer Creek enters the City of Shoreline in the area enclosed by the south cloverleaf off-ramp for Interstate 5 at NE 205th Street and exits the city just downstream of NE 196th Street.

McAleer Creek passes beneath NE 205th Street through a 4-by-6-foot box culvert. The creek flows approximately 300 feet in an open water course before entering a culvert beneath the south cloverleaf off-ramp for Interstate 5. Downstream of the south cloverleaf, the stream flows 24 feet before entering a 72-inch diameter culvert beneath Forest Park Drive NE. Downstream of Forest Park Drive NE, the stream flows approximately 1,500 feet to a 4-by-4-foot box culvert beneath 15th Avenue NE. At this point, the west tributary flows into the main stem just upstream of the 15th Avenue NE box culvert. From there, the creek continues its course until it reaches the McAleer Creek Regional Detention Pond on the north side of NE 196th Street and approximately 500 feet east of 15th Avenue NE.

The McAleer Creek Regional Detention pond is controlled with a sluice gate at the upstream end of the dam. The pond's maximum surface area is 1 acre and it extends 550 feet upstream of NE 196th Street in a natural ravine on McAleer Creek.

After exiting the pond, McAleer Creek flows through a 12-by-8-foot box culvert under NE 196th Street, where it leaves the City of Shoreline and enters the City of Lake Forest Park. The channel section in this area transitions gradually from a manmade residential channel to a natural ravine. The main stem of McAleer Creek then flows through Lake Forest Park and empties into Lake Washington.

The subarea drains into four of the main sub-basins for McAleer Creek. The northern section of the subarea drains into the west tributary of McAleer Creek. The west tributary drains the Interstate 5 corridor and west basin south of NE 205th Street. The west tributary follows along the west side of 6th Avenue NE as an open water course. It remains open, running east along NE 200th Street, until it enters a culvert just west of I-5. The tributary remains piped for approximately 1,500 feet and daylights just before its confluence with the main stem. The west tributary drainage enters the main stem in an open channel upstream of 15th Avenue NE.

The eastern section of the subarea drains into two sub-basins. A portion discharges into Brookside Creek. Brookside Creek drains into McAleer Creek just downstream of NE 178th Street in the City of Lake Forest Park. At the Brookside Elementary School in Lake Forest Park, the tributary divides into west (Hillside Creek) and south (Brookside Creek) forks. The Basin Characterization Analysis states that it is not evident in the field whether either fork extends into the City of Shoreline (Tetra Tech/KCM 2004d).

The other portion discharges into Whisper Creek. Whisper Creek (also called Cedar Brook Creek) enters McAleer Creek from the west, out of a ravine approximately 200 feet downstream from Perkins Way near NE 185th Street. Segments of the creek lie inside Shoreline's city limits. The total length of the segments in the city is approximately 1,300 feet. Predominantly spring-fed from five major sources within the Shoreline city limits, the tributary potentially offers, for its size, the best continuous clean water source, cover, and substrate in the basin, and contributes to good water quality in the lower main stem of McAleer Creek.

The western corner of the subarea along N 185th Street, from Stone Avenue N to Aurora Avenue N (Hwy 99) enters the Echo Lake Drainage sub-basin. Echo Lake is in the western portion of the McAleer Creek Basin. Echo Lake has a year-round open water area of approximately 13 acres. The outlet stream from the lake, beginning at the lake's north end, flows north to Lake Ballinger (outside the city), which in turn outlets into McAleer Creek. The outlet of the Echo Lake is piped until passing beneath North 200th Street. North of the street crossing, the drainage is highly confined as it flows through an open water course surrounded by a commercial development to the west and residential neighborhood to the east. The primary inlet to the lake is a pipe entering at the south end that drains an area extending west of Aurora Avenue N.

Surface Water Treatment Facilities

There are a number of treatment facilities and detention facilities within the subarea. Surface water infiltration occurs within a few of the parks within the subarea. The largest infiltration area is in Shoreline Park (owned by the City of Shoreline) and the soccer fields at the Shoreline Center (owned by the Shoreline School District).

Surface Water Collection Systems

Table 3.5-5 summarizes surface water facilities managed and maintained by the City of Shoreline, from the City's Surface Water Master Plan.

Within the subarea, there are approximately 11,500 feet of surface water pipes less than 8" in diameter, 64,500 feet of surface water pipes between 8" and 18" in diameter, and 5,900 feet of pipes larger than 18-inches in diameter.

Although the City of Shoreline has only been incorporated since 1995, the area encompassed by the city was largely developed in the 1960s and 1970s. Consequently, the age of the majority of the City's surface water infrastructure is greater than 40 years.

Table 3.5-5 Surface Water Drainage System Infrastructure

Drainage System Component	Estimated Quantity	Unit
Surface water pipe	500,000 (95)	Linear Foot (LF) (Miles)
Catch Basins	5,500	Each
Ditches	180,000 (34)	LF (Miles)
Outfalls (to open water courses)	60	Each
Outfalls (to Puget Sound)	Unknown	Each
Retention and Detention Facilities Maintained by the City	95	Each
Retention and Detention Facilities (privately maintained)	219	Each
Lift Stations	2	Each

Since the life expectancy of this type of infrastructure (pipes and catch basins), is estimated at 50 years, the majority of the surface water infrastructure in the city is at or approaching its useful life expectancy.

The majority of pipes within the subarea are concrete, with a number of corrugated metal pipes south of NE 180th Street, and east of I-5.

Many of the streets within the subarea do not possess curb and gutter. Surface water is conveyed through a series of ditches, swales, and sheet flow on private lawns. If development is projected within the subarea, many of these streets will be improved to accommodate higher volumes of vehicles and pedestrians, and may be developed into a more urban street network. When this occurs, many of the ditches and sheet flow dispersion areas will be converted to curb gutter and sidewalk, requiring installation of an enclosed pipe network, with detention and treatment facilities. The majority of ditches within the subarea are along 5th Avenue NE, NE 194th Street, and NE 195th Street. If pedestrian improvements are made to these streets, the majority of these ditches will become piped, or converted to bioswales or other Low Impact Development stormwater feature.

Current Demand

As part of this study, surface water runoff within the subarea was estimated using the Rational Method. The analysis provided an estimated volume and discharge through the City's surface water conveyance system within the subarea during a 25-year storm event, for each zoning option. Percent impervious surface area for the subarea under current conditions was compared to proposed improvements. In order to assess surface water runoff generation within the subarea, this analysis references the Seattle Public Utilities methods for computing stormwater fees for residential units within the City of Seattle and neighboring communities. The SPU stormwater fee structure provides a relative impervious surface area based on average lot size and type of development. The EIS study estimated the amount of stormwater reaching the municipal surface water collection system for each customer class. The analysis undertaken was for EIS planning purposes only. The purpose of the study was to receive a relative understanding of the increase in surface water discharge potential zoning increases will have on the current surface water collection system. The analysis performed has no bearing on the existing Surface Water Master Plan. Actual improvements and exact upsizing of sections of infrastructure will not be known until extensive hydraulic modeling is completed for the subarea.

Table 3.5-6 depicts the percentage of impervious surface area for residential homes, based on size.

Commercial and institutional development was analyzed based on the assumption that the majority of these developments will have similar impervious surface areas to very heavy residential units. Under this assumption the average runoff factor would be 0.76 (76 percent impervious).

The City of Shoreline's surface water conveyance system was analyzed using the Rational Method, based on a 25-year storm event, and the percent of impervious surface area for each zone. Calculations by area (in acres) were multiplied by the applicable average runoff factor in Table 3-5.5 for each zoning/density type. (Example: R-6 zone = 7,000 to 10,000 square foot lots, and has an average runoff factor of 0.48.)

Assumptions were based on Chapter 3 of the 2009 King County Surface Water Design manual, a 24-hour precipitation factor of

2.6 based on current 25-year isopluvial maps, and an average runoff time of concentration of 30-minutes. Surface water runoff rates were based on the following calculation: Total Flow = Runoff Factor x Area (acres) x 2.6 (25-year storm precipitation amount in inches) x 0.29 (peak runoff factor for a 30-minute time of concentration – Equation 3-4 of the 2009 King County Stormwater Design Manual). The total estimated runoff from the subarea, under existing conditions is 224.70-cubic feet per second (CFS), from the 25-year storm event.

Table 3.5-6—Impervious Surface Area for Residential Homes

Small Lot Residential

Class	SF	% Impact	Avg. Runoff Factor
Tier A	<3,000	N/A	0.65
Tire B	3,000 to < 5,000	N/A	0.53
Tier C	5,000 to < 7,000	N/A	0.51
Tier D	7,000 to < 10,000	N/A	0.48

General Service/Large Lot Residential

Undeveloped	Regular	0-15%	0.18
	Low Impact	0-15%	0.31
Light	Regular	16-35%	0.32
	Low Impact	16-35%	0.41
Moderate	Regular	36-65%	0.43
	Low Impact	36-65%	0.53
Heavy		65-85%	0.66
Very Heavy		86%-100%	0.76

3.5.1 d Electricity

Electricity is supplied by Seattle City Light. The Seattle City Light service area includes all of the City of Seattle, portions of the cities of Burien, Tukwila, SeaTac, Shoreline, Lake Forest Park and Renton, as well as portions of unincorporated King County.

Electricity Sources

Seattle City Light obtains energy from a mix of sources. **Table 3.5-7** shows the distribution of energy sources used by Seattle City Light.

Table 3.5-7 Energy Sources Used by Seattle City Light

Generation Type	Percentage
Hydroelectric	89.8% *
Nuclear	4.4%
Wind	3.9%
Coal	0.8%
Landfill Gases	0.5%
Other	0.6%

*50% from the Skagit and Pend Oreille Rivers

Transmission Corridor

The transmission corridor servicing the City of Shoreline runs southeast through tracts and easements through Snohomish County until it reaches NE 185th Street, within the City of Shoreline. At NE 185th Street, the transmission corridor turns due south and runs parallel to 8th Avenue NE, adjacent to the eastern edge of the subarea. The transmission corridor continues to

parallel 8th Avenue NE, as it connects into its main service area within the City of Seattle.

Distribution Network

Seattle City Light does not provide service area maps of their distribution network. The distribution network within the subarea is currently a mix of overhead and underground facilities. The majority of the area is serviced by overhead electricity lines, which share the space with telecommunication networks within the area. Typically transferring electricity lines from overhead to underground occurs only when either building setbacks are too tight to allow overhead lines, new developments pay for undergrounding within their development area, cities undertake capital improvement projects (CIPs), or neighborhoods agree to pay for underground improvements. There is current work being done to underground a large portion of lines between NE 145th Street and NE 205th street, along Aurora Avenue N.

Current Demand

Current demand projections are based on a study prepared by the US Energy Information Administration. In 2009, a nationwide survey was conducted, depicting residential energy usage for different demographics throughout the United States. According to the survey, residents in Washington used on average 5 percent less electricity per capita that the average for all Pacific Coast users. Based on an average 2.4 persons per household, the average household uses 31.84 million British Thermal Units (BTUs) per year. This equates to 87.23 thousand BTUs per household per day. The total residential demand currently projected within the subarea is 693 million BTUs per day.

Commercial energy demands were based on a US Department of Energy survey of various commercial, government, and institutional building usage types. **Table 3.5-8** presents a summary of the information.

Table 3.5-8 US Department of Energy Survey on Energy Demand Commercial Sector Energy Consumption, March 2012

Building Type	Thousand BTUs/SF/Year
Health Care	345.9
Food Sales	535.5
Lodging	193.1
Office	211.7
Mercantile	223.6
Education	159
Service	151.6
Food Service	522.4
Religious	77
Public Order	221.1
Warehouse	94.3
Public Assembly	180
Vacant	33.1
Other	318.8
Average	**233.36**

Based on these figures, the average annual energy use for commercial developments is 233.36 thousand BTU/SF of space per year, or 0.64 thousand BTU/SF per day. The total daily commercial energy demand, based on four office workers per 1,000-square feet is 231 million BTUs per day. The total estimated

demand on the system within the subarea is 924 million BTUs per day.

3.5.1 e Natural Gas

Puget Sound Energy provides natural gas service to the residents of the City of Shoreline. The City maintains a franchise agreement (Ordinance #308) with Puget Sound Energy through October 31, 2017.

Sources

Puget Sound Energy purchases natural gas from other regions and manages the distribution of natural gas to customers within its service area. They regulate pressure, and develop and maintain distribution lines within their service areas.

PSE purchases 100 percent of the natural gas supplies needed to serve its customers. About half the gas is obtained from producers and marketers in British Columbia and Alberta, and the rest comes from sources within the Rocky Mountains.

After purchasing natural gas, PSE controls its gas supply by storing gas in large underground facilities, and withdrawing gas in the winter when customer usage is highest. PSE co-owns the largest natural gas storage facilities in the Pacific Northwest in Jackson Prairie, Washington. The storage facility can hold about 44 billion cubic feet of natural gas, and can meet up to 25 percent of the Pacific Northwest's peak demand on the coldest days in winter. PSE also stores 12.9 billion cubic feet of natural gas in a facility in Clay Basin, Utah. From these storage facilities, PSE transports gas through main pipelines to its service areas in the Puget Sound region, where it is distributed to customers in the region through 21,000 miles of service lines.

Washington State Utilities and Transportation Commission (WUTC) does not define natural gas as an essential service. Therefore, Puget Sound Energy is not required to provide services.

Extension of service is based on individual requests and the results of an analysis to determine if revenues from a developer extension will offset the cost of construction. Overall, Puget Sound Energy does not foresee any problems that would limit the supply of natural gas to the City of Shoreline in the future.

Transmission Main

Natural gas is currently supplied to most areas within the City of Shoreline through 136 miles of natural gas mains. Gas flows through the system through a 16 inch high pressure force main located along 10th Avenue NE continuing west along NE 180th Street, and south along 5th Avenue NE. As of December 2011, Puget Sound Energy serves approximately 11,556 customers in the City of Shoreline with natural gas.

Distribution Network

Within the subarea, 6-inch high pressure mains run along Aurora Avenue N, NE 185th Street, 8th Avenue N, NE 190th Street, N 175th Street, and 5th Avenue NE. The majority of residential connections are through 5/8 inch laterals. A series of 1-1/4" to 4" distribution mains stem off the 6" transmission mains, serving all sides within the subarea. **Figure 3.5-4** illustrates existing natural gas service in the subarea.

Current Demand

Puget Sound Energy serves approximately 760,000 natural gas customers in 10 counties within Washington State. Natural gas connections are extensive within the subarea. No demand quantities are presently available. However, the current configuration adequately services the subarea. Upsizing lines and connecting stub-outs to form loops may be necessary if the area is further developed.

3.5.1 f Communications

Purveyors

According to the Shoreline Comprehensive Plan, there are multiple communications companies operating within the City of Shoreline. Service within the city is provided through a network of overhead and underground services. Service providers that serve residential and commercial customers in the vicinity of the subarea are summarized below.

Comcast

Comcast provides land-line cable television, internet service, and Voice over Internet Protocol (VoIP) or digital telephone service. The City of Shoreline maintains a franchise agreement with Comcast to maintain and operate their cable and fiber optic network within the city limits. Comcast currently serves the entire City of Shoreline. No maps of Comcast's distribution network are currently available.

Frontier Communications

Frontier Communications provides land-line cable television, internet service, VoIP, and local telephone service to the community. The City of Shoreline maintains a franchise agreement with Frontier Communications to maintain and operate their cable and fiber optic network within the city limits. There is currently no franchise agreement with Frontier for the local telephone service. Frontier Communications serves the area west of Meridian Avenue N and north of N 160th Street/NW Innis Arden Way. Currently their footprint within the subarea is relatively small, only serving the four blocks west of Meridian Avenue N, along N 185th Street. They recently completed a project within the City of Shoreline installing fiber cable in their service area. According to an email from their network engineer, Jeremy Fallt, their current demand is very low. Within their service area, they have a residential and commercial customer demand of approximately 25 percent for broadband, 15 percent for TV, and 20 percent for phone. Their phone cable and fiber networks were built to handle a capacity of 100 percent within the service area. There are no forecasted projects or plans for growth in the near future.

CenturyLink

CenturyLink provides local telephone service to the area east of Meridian Avenue N, and south of N 160th Street/NW Innis Arden Way. CenturyLink serves the majority of the population within the subarea, serving everyone west of Meridian Avenue N. Currently, they do not have a franchise agreement with the City of Shoreline.

Integra Telecom

Integra Telecom provides a fiber optic data network within the City of Shoreline. They have a franchise agreement with the City through July 24, 2026. They primarily serve commercial and institutional users. Their network passes through the subarea along 8th Avenue NE and NE 180th Street along a series of overhead wires before going to an underground conduit east of 12th Avenue NE. Currently there are very few end users within the City of Shoreline. With the potential for future growth within the subarea, Integra Telecom has the potential for more service connections and possibly expanding their network in the future.

Zayo Group (formerly AboveNet Communications)

Zayo Group provides a fiber optic data network within the City of Shoreline. Prior to being purchased by Zayo Group, AboveNet Communications had a franchise agreement with the City of Shoreline, through September 9, 2021. Zayo Group is a global provider of bandwidth infrastructure services, including dark fiber, wavelengths, SONET, Ethernet, and IP services. They have network in seven countries and 45 states. They primarily serve commercial and institutional users. Their network currently does not encroach upon the subarea.

Zayo Group owns a Metro Dark Fiber run along the west coast of the United States. The run continues along Aurora Avenue N, just west of the subarea limits. The dark fiber provides a secure major bandwidth fiber optic connection for commercial and institutional users. They are currently constructing a connecting fiber run along NE 165th Street, just south of the study limits, and along 244th Street SW, north of the study limits, which connects to their main Metro Dark Fiber run along Aurora Avenue N. Along with Integra Telecom, Zayo Group has the potential for future service connections within the subarea, if future commercial development growth occurs.

Communications Network

Figure 3.5-5 at the end of this section shows partial mapping of existing communications lines located within the subarea, as made available for this analysis. There are extensive communication lines and facilities located in the subarea that are not shown in the figure because this information was not made available for the purposes of this analysis.

Undergrounding of Utility Lines in the City of Shoreline

It is the goal of the City of Shoreline to facilitate undergrounding of utilities including power and communications lines in order to promote the health, safety, and general welfare of the residents of the community by:

- Removing potential hazards and blockages from the right-of-way;
- Achieving a more aesthetically pleasing community while improving property values; and
- Decreasing the vulnerability of service delivery due to the effects of natural disasters and storm events.

A specific policy of the 185th Street Subarea Plan calls for developing a strategy for undergrounding overhead utilities in the subarea. As more capital improvements occur within transportation rights-of-way to facilitate future growth, more of

the current overhead utilities could be relocated underground in coordination with the utility providers.

3.5.2 Analysis of Potential Impacts

3.5.2 a Impacts Common to All Alternatives

All four alternatives within the subarea would result in some population growth. Any growth within the city would ultimately require some improvements or upsizing of utilities to serve projected demands within the subarea. Recommended improvements within this study are based on a planning level of analysis of each utility in relation to the area of rezoning and projected growth. The following recommendations represent an estimate of improvements likely to be necessary within the subarea under any of the action alternatives.

Once the rezoning is adopted, each utility provider would be responsible for conducting more detailed hydraulic modeling reflecting projected changes in land use in the subarea. With the more detailed hydraulic modeling, upsizing and other facility improvement needs would be confirmed more definitively. The following improvements would need to be implemented regardless of which alternative is adopted.

Water

The North City Water District contains many 6" diameter water mains with dead end stub outs. These pipes may need to be upsized to provide adequate fire suppression if development occurs within the North City Water District region of the subarea.

Fire suppression is currently adequate within the Seattle Public Utilities service area. Two fire hydrants currently provide less than 2,000 gpm of fire flow. The International Fire Code (IFC), Appendix B requires a minimum of 1,000 gpm of fire flow suppression. Additional demand on the system could prevent these water mains from producing adequate fire suppression in the future. One fire hydrant is located at the intersection of N 180th Street and 2nd Avenue NE on an 8-inch dead end line. This line may need to be connected in a loop to continue to provide adequate fire flow if additional demand is incurred on the system from future developments. The other fire hydrant is located north of the intersection of N 180th Street and Sunnyside Avenue N. This hydrant is located on a 6" line. This water main may need to be upsized and or connected into a loop. The Seattle Public Utilities also contains many water mains 6" or less in diameter, which end in dead-end stub outs, many of which do not currently contain fire hydrants. If new developments within the Seattle Public Utilities region of the subarea require a higher level of fire suppression, these pipes may need to be upsized and include additional fire hydrants.

Wastewater

All mainline pipes within the subarea are 8" in diameter or larger. Many of the 8" diameter pipes may need to be upsized to provide suitable collection capacity for sewer flows from new developments if the subarea is rezoned and demand is increased. Refer to Section 3.5.2b for an in-depth analysis of demand impacts for each rezoning alternative. According to a phone

conversation with a representative from Ronald Wastewater District, there are three sewer lift stations serving the subarea. These lift stations handle a significant portion of the sewer capacity within the subarea. New demand put on the system may require upsizing these lift stations.

Ronald Wastewater District pays for wastewater treatment for discharging wastewater to the King County's West Point Treatment Plant and the City of Edmonds Treatment Plant. Greater flow through the sewer system will incur greater charges from the perspective of the treatment plant for accepting additional wastewater.

Surface Water

Since the majority of surface water collection pipes are reaching the end of their serviceable life, an active capital improvement plan should be adopted to replace damaged or undersized pipes.

In order to adequately capture surface water from the surrounding area, the 11,500 feet of surface water pipes less than 8" will most likely need to be upsized to handle projected storm flows. Additionally, if any development occurs along 5th Avenue NE, NE 194th Street, or NE 195th Street, pedestrian improvements will most likely be installed, requiring installation of surface water facilities for approximately 5,000 feet, including but not limited to piped stormwater conveyance pipes, pervious pavement, or bio-retention swales within roadside planters.

Electricity

No capacity constraints were provided for the electricity network within the City of Shoreline. New development within the subarea may require sections of the overhead electricity lines to be placed underground. Costs for undergrounding projects are typically placed on the developers, unless the project is part of a capital improvement project undertaken by the City, in which all utilities are required to be placed underground to accommodate the City's roadway improvements.

Natural Gas

No demand projections were available under existing conditions, so the capacity of the network could not be analyzed. In order to better serve future development within the subarea, many of the smaller gas mains could be connected to form loops. This information is based on observation. Future improvements and additions to the natural gas network are based solely on future customer requests for service.

Communications

None of the communications providers provided demand projections within the subarea, so the capacity of each network could not be analyzed.

Frontier Communications recently completed a major utility project within the City of Shoreline. They do not anticipate any improvements in the foreseeable future. The company currently serves only the western portion of the subarea, west of Meridian Avenue N. Their system is currently serving 25 percent of their projected capacity. They have the ability to take on 300 percent more customer base within their portion of the subarea.

Integra Telecom and Zayo Group serve primarily commercial and institutional customers. Under Alternative 2, 3, or 4, considerably

more commercial development is projected within the subarea. With additional commercial development, these communication networks may extend their branch lines further within the subarea. Future improvements are based on forecasted development and future customer request for service.

The only expense projected for communication networks is undergrounding their facilities that currently share poles with overhead electricity lines. Communication networks will be required to place their systems underground if developers or the City of Shoreline decides to underground existing utilities within a section of the city.

3.5.2 b Future Growth Demand Forecasting

Future growth demand forecasting for each utility was performed by Otak, Inc. The analysis is based on an estimated utility demand multiplied by projected residential and commercial population forecasting for each zoning alternative. The demand forecasting is used specifically for this EIS analysis for the subarea based on a planning level of analysis. Detailed hydraulic modeling would need to be completed by utility providers in the future as part of updating comprehensive plans/master plans. Demand was forecast for build-out of each alternative. Recommended mitigation measures (including improvements) needed to serve build-out, as well as the next twenty years of growth through 2035, are presented later in this section.

Water

Estimated water demand rates were projected for the four alternatives for the projected population in 2035, based on per capita demand rates discussed in section S.5.1a of this analysis. **Table 3.5-9** shows the demand for water related to the alternatives.

This analysis, as that for other utilities, was based on review of projected development and population within Traffic Analysis Zones (TAZs) served by the Seattle Public Utilities and North City Water District. Referencing of TAZs, which correlate to census tract population data, is a common practice in planning and assessment of potential impacts as part of environmental analysis. A map of the TAZs related to the subarea and included in the analysis is provided as **Figure 3.5-6** at the end of this section. Refer to this map in review of the discussion below, which describes assumptions related to TAZ areas.

The following recommendations for each alternative are based on a planning level of analysis of the system and review of supply and demand presented in the most current Comprehensive Plan for both the Seattle Public Utilities and North City Water District. Once the rezoning has been adopted for the subarea, both the North City Water District and Seattle Public Utilities would need to update their hydraulic model in congruence with their comprehensive master plans to determine exact upsizing and necessary improvements required to serve the forecasted population and land use.

Alternative 4—Preferred Alternative

Complete build-out of Alternative 4—Preferred Alternative would potentially increase water demand up to 670 percent of the current demand within the system. All zones with the exception of TAZ 66 are projected to increase in demand substantially over existing conditions. The North City Water District is projected to see a 640 percent increase in demand within the subarea. The Seattle Public Utilities is projected to see a 690 percent increase in demand within the subarea. All 6" diameter pipes within the subarea would most likely require upsizing to 8" to 12" pipes, and dead-end mains should be connected into a loop to provide adequate pressure and fire suppression throughout the subarea. Increasing demand by nearly seven times the current water demand projected within the subarea may have an affect beyond just the distribution system. Hydraulic modeling should occur on all source of supply, booster stations, and storage reservoirs to verify supply would be adequate for the projected population.

Alternative 3—Previous Most Growth

Complete build-out of Alternative 3—Previous Most Growth would potentially increase water demand up to 520 percent of the current demand within the system. The 30" steel transmission main located along N 185th Street would most likely be of sufficient diameter for water transport; however, the age of the pipe should be considered for future development along N 185th Street. Although there have been no analysiss of problems with this transmission main, the main was installed in 1955. The distribution mains spanning off this 30" transmission are primarily 6" to 8" mains, within the Seattle Public Utilities service area. The majority of lateral mains stemming off the transmission main would most likely need to be upsized to provide adequate fire suppression and peak daily demand to areas within the subarea. The majority of zones forecasted to produce higher demands are located within the North City Water System, with the exception of TAZ 38, which is served by the SPU water system. The zones within the North City Water District that are projected to see the greatest increase in water demand are TAZ 124 and TAZ 126 with over 2,000 percent increase over existing conditions respectively in each zone. TAZ 38 is projected to increase demand by approximately 8,500 percent over current demand projections. Upsizing would need to occur around TAZ 38 within the SPU water system and most likely TAZs 11, 124, and 126. The only zones that do not forecast high water demand increases are TAZs 66, 79, and 125.

Alternative 2—Some Growth

Complete build-out of Alternative 2—Some Growth would potentially increase water demand up to 200 percent of the current demand within the system. As under Alternative 3, the 30" steel transmission main and associated piping, located along N 185th Street, likely would have capacity to serve Alternative 2; however, the age of the pipe should be considered.

Very few pipes extend into TAZ 38, which is projected to increase demand by 2,275 percent over the current demand. TAZ 38 is located between the service areas of Seattle Public Utilities and North City Water District; however, it is currently served solely by the Seattle Public Utilities. Pipes within this zone would need to be connected into a loop and most likely upsized in order to provide adequate fire suppression and peak daily demands within this zone. Coordination between the two water systems may be necessary to meet the projected demands under this scenario.

The zones that do not forecast high water demand increases are TAZs 11, 36, 37, 40, 66, 79, 125, and 127.

Within the Seattle Public Utilities service area of the subarea, approximately 7,200 feet of water mains are less than 6" in diameter. In order to adequately provide fire suppression, these mains may need to be upsized under Alternative 2, 3, or 4. The majority of undersized mains are located along N 183rd Street, from Meridian Avenue N past the boundary of the subarea to the intersection of Midvale Avenue N, and the residential neighborhood north of N 185th Street between 1st Avenue NE and Meridian Avenue N.

Within the North City Water District service area of the subarea, approximately 8,400 feet of water mains are 6" diameter dead end mains. In order to adequately provide fire suppression and adequate pressure as demand increases under Alternative 2, 3 ,or 4, the majority of these mains may need to be upsized or connected into a loop.

Table 3.5-9—Demand for Water Service, All Alternatives

	EXISTING CONDITIONS	ALTERNATIVE 1—NO ACTION		ALTERNATIVE 2—SOME GROWTH		ALTERNATIVE 3—PREVIOUS MOST GROWTH		ALTERNATIVE 4—PREFERRED ALTERNATIVE	
	Total Water Demand (gpd)	Total Water Demand (gpd)	% Growth from Existing	Total Water Demand (gpd)	% Growth from Existing	Total Water Demand (gpd)	% Growth from Existing	Total Water Demand (gpd)	% Growth from Existing
Seattle Public Utilities:									
Totals	310,892	351,716	13%	1,171,165	277%	2,367,524	662%	2,461,848	692%
North City Water District:									
Totals	358,288	394,880	10%	771,281	115%	1,768,981	394%	2,658,790	642%
Total of Both Water Systems	669,180	746,595	12%	1,942,446	190%	4,136,504	518%	5,120,637	665%

Alternative 1—No Action

Based on water demand projections and population growth rates for 2035, implementation of Alternative 1—No Action would have little to no effect on the existing water system. The TAZ with the most improvements will be TAZ 7, with a 43 percent increase in growth. One water line in this zone is a 200-foot-long 4" dead-end main on N 185th Court. Currently, no fire hydrant is located at the end of this water main. If new developments at this location require a higher level of fire suppression than is currently provided, the line will need to be upsized.

Wastewater

Estimated wastewater demand rates were projected for the four alternatives for the projected population in 2035, based on per capita demand rates discussed under 3.5-1b in this section. The following recommendations for each alternative are based on a visual analysis of the system and review of supply and demand presented in 2010 Comprehensive Sewer Plan for the Ronald Wastewater District. Once the rezoning alternative has been decided upon for the subarea, Ronald Wastewater District will need to update their hydraulic model in congruence with its comprehensive master plan to determine exact upsizing and necessary improvements required to serve the forecasted population. **Table 3.5-10** shows the demand for wastewater related to the alternatives.

Alternative 4—Preferred Alternative

Complete build-out of Alternative 4—Preferred Alternative would have the greatest effect on the wastewater collection system within the subarea, with a 661 percent increase in flow rates over the existing system. The only TAZs that would not be dramatically affected by the Alternative 4—Preferred Alternative would be TAZs 66 and 125. Wastewater demand would not just be concentrated along N/NE 185th Street, but would expand throughout the study area to NE 195th Street, and south to NE 175th Street. Demand increase would affect nearly all the side streets within the subarea, and may require upsizing multiple sections of pipes 8" in diameter and above, as well as upsizing the three lift stations serving the subarea.

Alternative 3—Previous Most Growth

Complete build-out of Alternative of Alternative 3—Previous Most Growth would have significant effect on the wastewater collection system within the subarea, with a 508 percent increase in flow rates over the existing system. The only TAZs that would not be dramatically affected by the Alternative 3—Previous Most Growth would be TAZs 66 and 125. Similarly to Alternative 2, the majority of wastewater demand would be concentrated along N/NE 185th Street. However, demand increase would affect nearly all the side streets within the subarea, and may require upsizing multiple sections of pipes 8" in diameter and above, as well as upsizing the three lift stations serving the subarea.

Alternative 2—Some Growth

Implementation to complete-build out of Alternative 2—Some Growth would have a dramatic effect on the wastewater collection system within the subarea, with a 92 percent increase in flow rates over the existing system. The majority of demand would be centered along N/NE 185th Street, forecasting wastewater demand rates at a 1,877 percent demand increase in TAZ 38 and a 559 percent increase in TAZ 124.

The majority of sewer mains within the subarea are 8" gravity mains. With the increase in projected demand under any of the alternatives (Alternative 2, 3, or 4), a large number of sewer mains may need to be upsized.

Alternative 1—No Action

Based on wastewater demand projections and population growth rates for 2035, implementation of Alternative 1—No Action

would have little to no effect on the wastewater system, with 11 percent increase in projected demand over the existing system. The TAZ with the most improvements will be TAZ 7, with a 44 percent increase in growth. Growth projections for Alternative 1—No Action should not require the upsizing of any pipes within the system.

Table 3.5-10—Demand for Wastewater Service, All Alternatives

	EXISTING CONDITIONS	ALTERNATIVE 1—NO ACTION		ALTERNATIVE 2—SOME GROWTH		ALTERNATIVE 3—PREVIOUS MOST GROWTH		ALTERNATIVE 4—PREFERRED ALTERNATIVE	
	TOTAL SEWER DEMAND (gpd)	TOTAL SEWER DEMAND (gpd)	% Growth from Existing	TOTAL SEWER DEMAND (gpd)	% Growth from Existing	TOTAL SEWER DEMAND (gpd)	% Growth from Existing	TOTAL SEWER DEMAND (gpd)	% Growth from Existing
Totals	788,063	878,317	11%	1,516,803	92%	4,787,862	508%	6,000,172	661%

Surface Water

Surface water management is not directly impacted by population; however, more development will produce larger areas of impervious surface, reduce the discharge time for surface water to enter city facilities, and generally increase stormwater runoff. Because the subarea was developed before adoption of stormwater standards drainage problems currently exist.

New redevelopment projects would be subject to Department of Ecology regulations for flow control and water quality. (Refer to discussion under 3.5.3b later in this section.) Integration of low impact development (LID) and green infrastructure into redevelopment projects can help developed areas manage stormwater like natural systems. Bioswales, rain gardens, and other features capture and retain water onsite, allowing time for it to soak into the soil, where it is naturally filtered. This process also captures pollution and improves water quality. LID treatments are encouraged by policies in the City's Comprehensive Plan, as well as in this Subarea Plan, and are required by Code.

Surface water management demand, based on precipitation rates for the 25-year peak storm event discussed in section 3.5.1c of this analysis, and percent impervious surface area for each zoning alternative is shown in **Table 3.5-11**.

Alternative 4—Preferred Alternative

Alternative 4—Preferred Alternative is projected to create an increase of surface water flow by 37 percent over existing conditions, for a total 25-year peak storm runoff rate of 303 cfs. This does not mean that additional flooding would occur; it means that new redevelopment projects would be required to control and manage the additional flow to levels regulated by the DOE and City of Shoreline. The TAZs projected to see the most increase in storm flow runoff would be TAZs 7 with an increased surface water generation of 6.5 cfs over existing conditions, 34 with an increase of 20 cfs, 36 with an increase of 8 cfs, 37 with an increase of 8 cfs, and 132 with an increase of 6.4 cfs.

Alternative 3—Previous Most Growth

Alternative 3—Previous Most Growth is projected to create an increase of surface water flow by 21 percent from existing conditions, for a total 25-year peak storm runoff rate of 272 cfs. The TAZs projected to see the most increase in storm flow runoff would be TAZs 64, 124, 126, 131, and 132.

Alternative 2—Some Growth

Alternative 2—Some Growth is projected to create an increase of surface water flow by 12 percent from existing conditions. The TAZs projected to see the most increase in storm flow runoff would be TAZs 64, 124, and 126. The entire subarea is projected to see a 25 cfs increase in storm flow.

Alternative 1—No Action

Alternative 1—No Action was assumed to have the same surface area as the existing system. Currently, the majority of the subarea is zoned R-6, and would remain so under Alternative 1—No Action. The total projected flow rate for Alternative 1—No Action would be 224.70 cubic feet per second (cfs) of storm water runoff for the peak 25-year storm event. TAZs 36, 37, and 38 are projected to have the highest surface water discharge rates of 39 cfs, 26 cfs, and 23 cfs respectively.

Under Alternative 1—No Action, there would be limited redevelopment requiring LID techniques or investment in stormwater capital projects, so existing drainage issues would continue.

Table 3.5-11—Demand for Surface Water Management, All Alternatives

	ALTERNATIVE 1—NO ACTION	ALTERNATIVE 2—SOME GROWTH		ALTERNATIVE 3—PREVIOUS MOST GROWTH		ALTERNATIVE 4—PREFERRED ALTERNATIVE	
	Flow (cfs)	Flow (cfs)	% Growth from Existing	Flow (cfs)	% Growth from Existing	Flow (cfs)	% Growth from Existing
TOTALS	224.70	250.58	12%	271.60	21%	303.10	37%

Electricity

Estimated demand rates for electricity were projected for the four alternatives for the projected population. **Table 3.5-12** shows the demand for electricity related to the alternatives.

Alternative 4—Preferred Alternative

Alternative 4—Preferred Alternative is projected to create an increase of energy demand by approximately 700 percent from existing. All the zones are forecasted to receive a substantial increase in demand, except for TAZs 10, 64, and 66. The entire subarea is projected to generate a demand of 7.383 billion BTUs per day.

Alternative 3—Previous Most Growth

Alternative 3—Previous Most Growth is projected to create an increase of energy demand by approximately 610 percent from existing. TAZs projected to see the most increase in electricity demand are 7, 10, 11, 37, 38, 40, 124, 126, 128, 131, and 132. The entire subarea is projected to generate a demand of 6.570 billion BTUs per day.

Alternative 2—Some Growth

Alternative 2—Some Growth would generate an increase in energy demand of almost 240 percent compared to existing conditions. TAZs projected to see the most increase in electricity demand are 7, 10, 38, 124, and 126. The entire subarea is projected to generate a demand of 3.086 billion BTUs per day.

Alternative 1 – No Action

Based on energy demand projections and population growth rates for 2035 Alternative 1 – No Action would have little to no effect on the electricity system network. The TAZ with the most improvements would be TAZ 7.

Table 3.5-12—Demand for Electricity Service, All Alternatives

EXISTING CONDITIONS	ALTERNATIVE 1—NO ACTION		ALTERNATIVE 2—SOME GROWTH		ALTERNATIVE 3—PREVIOUS MOST GROWTH		ALTERNATIVE 4—PREFERRED ALTERNATIVE	
Energy (Thousand BTU/Day)	Total Energy (Thousand BTU/Day)	% Growth from Existing	Energy (Thousand BTU/Day)	% Growth from Existing	Energy (Thousand BTU/Day)	% Growth from Existing	Energy (Thousand BTU/Day)	% Growth from Existing
924,420	1,040,741	13%	3,086,199	234%	6,570,263	611%	7,383,030	699%

3.5.3 Mitigation Measures

3.5.3 a Incorporated Plan Features

Incorporated plan features include improvements to services and facilities that are already being planned by the utility providers. These are described below to the extent that information was made available by existing providers. Additional improvements to the ones listed will be necessary to accommodate future development, depending on which land use plan is implemented. Refer to Section 3.5.3c for an approximate list of improvements necessary for each alternative in relation to the affected utility. Planned utility improvements in the subarea, along with additional recommended improvements to support implementation of the action alternatives (Alternatives 4, 3, or 2) are illustrated in **Figures 3.5-7 through 3.5-10** at the end of this section.

Water

North City Water District

The following is a list of recently completed and planned capital projects within the subarea for a 30-year improvement plan. Several of these projects have already been completed.

1. Replace 660 Booster Pump Station with a new North City Booster Pump Station. The estimated cost is $4,185,000, of which $285,000 would be incurred through connection charges and rate increases, and $3,900,000 would be acquired through bonds and loans. This project is expected to start in the fall of 2014 and will take approximately 15 months. This project will lower the 660 zone hydraulic grade line to 615, expand the existing zone area, and create additional 615 zone area to the west.

   This project is located within the North City Business District, at the eastern edge of the subarea, along 15th Avenue NE, near the intersection of NE 175th Street, within TAZs 66 and 67. None of the alternatives would see much demand increase within these TAZs. Nearby zones are projected to increase demands significantly under Alternative 2, 3, or 4. If this work affects other zones within the 590 pressure zone, specifically zones 124 and 126, the improvements should be reanalyzed to verify they meet adequate capacity for the forecasted demands.

2. Recoat and install railing on the 3.7-million gallon reservoir. This work is currently under construction. The reservoir is located northeast of the intersection of NE 179th Street and 15th Avenue NE, near the eastern edge of the subarea. The 3.7-million gallon reservoir currently services the 590 pressure zone in which the North City Utility District portion of the subarea is located. The estimated cost is $300,000.

   This work benefits the largest water storage tank currently serving the North City Water District portion of the subarea. Although the CIP project mentioned does not propose an increase in storage capacity, Alternatives 2 through 4 may require an increase in water storage for the system. The DOH recommends that the storage facilities servicing a system contain two days of Average Daily Demand for all Equivalent Residential Units within

the system. All the storage reservoirs within the system contain a standby storage capacity of 5.38-million gallons.

Under Alternative 2—Some Growth, the projected demand of 1.54-million gallons of water would be required for standby storage for prospective residences within the subarea. Under Alternative 3—Previous Most Growth, the projected demand of 3.54-million gallons of water would be required for standby storage for prospective residents within the subarea. For Alternative 4 –Preferred Alternative, the projected demand of 5.32 million gallons of water would be required for standby storage. Under these alternatives, there is potential that this projected demand coupled with the demand generated by the rest of the system would require additional water storage volume.

3. Install Supply Station #4 near the intersection of 5th Avenue NE and NE 185th Street. Additionally, install 12" water mains connecting to an existing 10" main along 5th Avenue NE. This work will assist in servicing the North City Water District customers located on the west side of I-5. This work was completed in 2012; however, the proposed location of the 185th Street Light Rail Station may require this recently installed capital improvement project to be relocated elsewhere west of I5.

   This CIP project is located adjacent to TAZ 38, which is projected to see the most water demand increase within the subarea. TAZ 38 could be serviced by both the Seattle Public Utilities District and the North City Water District. Under Alternative 2—Some Growth, this area is projected to use 454,059 gpd of water. Under Alternative 3—Previous Most Growth, this area is projected to use 1,682,478 gpd, and under Alternative 4—Preferred Alternative, this area is projected to use 767,127 gpd. The pipe sizing may need to be increased along the portion of the North City Water District's western service area, west of I-5, including upsizing the existing 10" transmission main that connects the system underneath the freeway. Additional analysis may need to be completed to verify the adequacy of the pump station size in relation to the projected demands under Alternatives 2 through 4.

4. Replace 980 feet of 4" water main with an 8" water main to meet fire flow velocities at the intersection of NE 185th Street and 14th Avenue NE. This work is located near the eastern edge of the project limits. The estimated cost is $463,000. This project is projected to be constructed in 2026.

   This CIP project is located outside of the subarea; however, due to its proximity to TAZs 124 and 126, the project may need to be reanalyzed for projected demand increases, depending on which alternative is implemented. Under Alternative 2— Some Growth, these zones would increase water demand by 325,000 gpd. Under Alternative 3—Previous Most Growth, these zones would increase water demand by 936,000 gpd, and under Alternative 4—Preferred Alternative, these zones would increase water demand by 1,154,000 gpd. The pipe selection may need to be upsized to accommodate the projected demands, depending on which alternative is implemented.

5. Replace and/or relocate/remove fire hydrants on 4" and 6" dead end mains. This work is proposed throughout the entire North City Water District. The estimated cost is $1,365,000 and is projected to be an ongoing project based on need and age of existing hydrants and pipes, with an overall completion date of 2026. As capital projects are constructed and new developments are built, the North City Water District will analyze each of the dead end fire hydrants to determine if a fire hydrant needs to be replaced or upgraded as part of another project. In these situations, hydrants will be improved before 2026.

   This CIP project would improve fire flow throughout the North City Water District's portion of the subarea. Due to the increased demand projected in a number of the zones within the subarea, many of the mains may need to be upsized to 8" or larger mains to provide suitable fire flow protection under Alternative 2, 3, or 4.

Seattle Public Utilities

The SPU 2013 Water System Plan describes general funding allocation for different aspects of the water system. Due to the broad overview of the SPU 2013 Water System Plan, details were not specific to the Shoreline area, and in particular the region surrounding the subarea. The only planned capital improvement project forecasted for the near future is upsizing and replacing approximately 3,000 feet of water mains along Aurora Avenue N (Hwy 99) between N 192nd Street and N 205th Street. The original water mains are a series of 4" to 8" cast iron mains installed as early as 1946. All proposed mains will be 8" ductile iron mains. This work is located north of the subarea, and should not be affected by future demands generated by any of the alternatives.

Wastewater

The following is a list of capital improvement projects from the Ronald Wastewater District 2010 Comprehensive Sewer Plan:

1. NE 185th Street Sanitary Sewer Improvements – Replace approximately 749 feet of 8" gravity sewer main and side sewers with 10" to 15" sewer mains from 12th Avenue NE to 16th Avenue NE. The estimated project cost is $417,000.

   This CIP project would assist with projected demand flows for all alternatives. Alternative 3 or 4 potentially could increase loading to where 10" to 15" pipes may not be large enough diameter pipe for the projected flow during peak conditions.

2. 1st Avenue NE Sanitary Sewer Improvements – Replace approximately 1,321 feet of 8" gravity sewer main and side sewers with 10" mains by pipe bursting from N 185th Street to N 180th Street along 1st Avenue NE. The estimated project cost is $719,000.

   This CIP project would assist with projected demand flows for all alternatives. Based on a peaking factor of 4 times the average daily demand generation for peak hour demand, Alternative 2 may increase loading to where 10" mains may not be large enough diameter pipe for the projected flow during peak conditions. Implementation of

Alternative 3 or 4 would greatly increase loading along this pipe run, and would require upsizing to larger diameter pipe than the planned 10" mains. The forecasted loading may require upsizing to 18" or larger mains to accommodate the projected peak demand.

3. Basin 17 Sanitary Sewer Improvements – Replace approximately 2,136 feet of 8", 10", and 15" gravity sewer main and side sewers with 10", 12", 18", and 21" sewer main along NE 180th Street from 10th Avenue NE to 8th Avenue NE, along 5th Avenue NE from NE 180th Street to NE 178th Street, and along NE 175th Street, from a 15" crossing of I-5 to near Meridian Avenue N. The estimated project cost is $1,305,000.

   This CIP project is located within TAZ 126. Alternative 3 would create a 2,200 percent and Alternative 4 would create a 2,700 percent increase in demand within this TAZ. Based on a peaking factor of four times the average daily demand generation for peak hour demand, either alternative may increase loading to where the proposed pipe diameter upsizing is not adequate to serve the projected population, especially for the improvements along NE 180th Street. Increasing the pipe diameters of the proposed pipes and upsizing additional pipes within the vicinity may be necessary to facilitate the projected demand.

4. 11th Avenue NE Sanitary Sewer Improvements – Replace approximately 3,252 feet of 8" and 10" gravity sewer main and side sewers with 10" and 12" sewer main along 11th Avenue NE from NE 175th Street to NE 168th Street, up 11th Place NE, and along NE 170th Street from 11th Place NE to 14th Avenue NE. The estimated project cost is $1,792,000, and is projected to be completed in 2016.

   This project is located at the southern end of the subarea. None of the alternatives propose much rezoning or future growth around the area where this capital improvement project is intended. This project will have some benefit for future growth within the region, but should not be adversely affected by increased demand from one of the alternatives.

These projects may be dramatically affected by the land use plan implemented by the City for the subarea, and many more sewer lines within the subarea likely would require upsizing. Additional hydraulic modeling would be required to confirm needs and determine priorities.

Surface Water

Five drainage issues identified within the City's Comprehensive Plan are directly associated with the subarea. These five issues are currently in the process of being designed or financed. Future growth in the subarea may require the capacity of the proposed designs to be re-evaluated.

1. Ronald Bog – Ronald Bog receives surface water from the surrounding streets and developments, including from TAZs 7, 11, 64, 131, and 132 within the subarea. The City has completed a comprehensive examination of the problem and determined that Ronald Bog is currently undersized to handle storm flows associated with the 25-

year storm event, and floods into neighboring properties. The City has identified a series of culvert replacements, channel improvements, pipe system replacements, a flood control berm, as well as flood monitoring and early warning system.

Additional analysis should be performed to determine if increased runoff generated by the selected alternative would require additional upsizing of the bog and associated pipe network. Based on a simple Rational Analysis method of the zones within the subarea feeding to Ronald Bog, Alternative 2 would see approximately 9 cfs increase in storm generation from existing conditions, Alternative 3 would see approximately 13 cfs increase, and Alterative 4 would see 23 cfs increase. Revisions to the hydraulic modeling should be completed for the system once the zoning alternative has been selected, to verify the amount of upsizing infrastructure necessary to accommodate projected runoff to Ronald Bog.

2. 12th Avenue NE and 11th Avenue NE, from NE 175th Street to NE 170th Street – The existing drainage system within this corridor daylights on the west side of 12th Avenue NE, and discharges into residential backyards. The water is then collected in catch basins on 11th Avenue NE and conveyed to a pond located at 17201 11th Avenue NE. The pond was designed to infiltrate flows and has no outlet. This area is subject to flooding during significant events. The City is currently planning to expand the ditch along 12th Avenue NE for use as an infiltration ditch. The ditch will provide additional storage and help infiltrate runoff to attenuate the flows coming into the area.

   This CIP project is located near the southeast corner of the subarea. The two TAZs that drain toward this surface water pond are TAZ 65 and 66. Alternative 4—Preferred Alternative will have the most affect on this CIP project. However, rezoning within these zones is projected to be minimal and should only increase surface water flows by a maximum of 4 cfs over existing conditions. Additional storage or flow control facilities may be required. Inclusion of LID and green infrastructure improvements would provide additional mitigation.

3. Serpentine Pump Station near 5th Avenue NE and NE 178th Street – Serpentine drainage system is a complex set of gravity pipes and pump stations that currently does not provide a 25-year level of service for flood protection. Drainage currently accumulates at the low spot on 5th Avenue NE near NE 178th Street because the capacity of the Serpentine Pump Station is inadequate to convey the necessary flow up into the system that runs down NE Serpentine Avenue. This problem was studied under the Thornton Creek Watershed plan. Two alternative solutions were identified (ranging from $900,000 to $1.8 million). Prior to implementing one of these solutions, the City invested in low impact development (LID)/green infrastructure in the contributing basin to address the drainage problems. The City received a grant in 2010 for this project.

The pump station would be potentially impacted by rezoning of TAZ 79, 127, and a portion of 126. If the majority of surface water from TAZ 79, 127, and 126 discharges to the pump station, Alternative 3 may increase flows by 5.4 cfs, and Alternative 4 may increase flows by 56.9 cfs for the 25 year storm event. Additional storage or flow control facilities may be required once the preferred alternative has been chosen. Additional LID and green infrastructure improvements would provide mitigation.

4. 10th Avenue NE near NE 174th Street – During the December 2007 storm event, 110th Avenue NE south of NE 175th Street was flooded. Based on City observation, this is a recurrent problem. The roadway drainage system backed up and flow came up out of the catch basins on the east side of the roadway, which resulted in stormwater flowing down the driveways into garages. A preliminary solution was identified in the Thornton Creek Watershed Plan and included detention and conveyance improvements. The detention could be on the south side of NE 175th Street between 10th Avenue NE and 11th Avenue NE.

   The rezoning will have little effect on this CIP project. No major rezoning is projected within this area. Under Alternative 3 or 4, there would be zoning changes along the neighboring blocks.

5. Pump Station No. 25 (located north of N 175th Street and east of I-5) – Flooding of structures, yards, and driveways due to undersized pump station. Replace pump and force main to provide additional pumping capacity. The City received a grant to correct this problem in addition to implementing LID/Green infrastructure in the tributary basin in 2010. LID/green infrastructure improvements are also part of the project to reduce flows to the Serpentine Pump Station.

   The pump station would be potentially impacted by rezoning of TAZ 79. The subarea's boundary is located near the pump station. None of the alternatives project a large amount of growth within this zone. If the majority of surface water from TAZ 79 discharges to the pump station, Alternative 3 will increase flows by 0.5 cfs, and Alternative 4 will increase flows by 2 cfs for the 25 year storm event. Additional storage or flow control facilities may be required once the preferred alternative has been chosen. Additional LID and green infrastructure improvements would provide mitigation.

Electricity

Seattle City Light does not generate a comprehensive plan of capital improvement projects. The main project underway within the City of Shoreline is undergrounding a section of electricity lines running along the Aurora Avenue N (Hwy 99) corridor. This project will abut the subarea, but should not have any major effect on rezoning within the subarea.

Natural Gas

Puget Sound Energy does not generate a comprehensive plan of improvement projects. Additionally, Washington State Utilities and Transportation Commission (WUTC) does not define natural

gas as an essential service. Therefore, Puget Sound Energy is not required to provide service. Extension of service is based on individual requests. Overall, Puget Sound Energy does not foresee any problems that would limit the supply of natural gas to the City of Shoreline in the future.

Communications

Future Telephone Services and Facilities

According to the City of Shoreline's Comprehensive Plan, Washington Utilities Trade Commission regulations require CenturyLink and Frontier to provide adequate telecommunications service on demand; and Section 480-120-086 of the Washington Administrative Code (WAC) requires CenturyLink and Frontier to maintain adequate personnel and equipment to handle reasonable demand and traffic. Because CenturyLink and Frontier provide service on demand, there are no limits to future capacity. Additionally, telephone service should only be restricted by bandwidth constraints on fiber optic networks that provide this digital service.

Future Cable Television and Broadband Services and Facilities

Although the demand for cable television is likely to continue to increase as population grows, access to cable television in Shoreline is likely to increase at the same pace as population growth. However, the demand for broadband services, including cable television, telephone and internet services, is likely to continue to grow as networks are supported with additional bandwidth. This growth will most likely occur relative to internet service, as more content becomes accessible online, and as people continue to communicate and interact online. These broadband services can be provided over fiber optic networks, cable networks or telephone networks.

3.5.3 b Applicable Regulations and Commitments

Washington State Department of Ecology and City of Shoreline Surface Water Management Requirements

Environmental regulations pertain primarily to surface water runoff for future development. The City of Shoreline has adopted a Western Washington Phase II National Pollutant Discharge Elimination System (NPDES) Permit to control pollutant loads and reduce peak flows from developed sites and municipal facilities within the city. There are seven goals pertaining to the NPDES Permit, two of which actively affect development growth within the subarea.

NPDES Goal #4 – Controlling Runoff from New Development, Redevelopment and Construction Sites

This goal requires that the City of Shoreline develop, implement, and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. The NPDES Permit intends to make Low Impact Development (LID) the preferred and commonly-used approach to site development

A major aspect of this goal is ongoing maintenance and inspection of surface water facilities. The City is currently meeting this goal by enforcing that private developers maintain their private surface water facilities permitted since 2007. The City of Shoreline inspects several hundred surface water facilities on a rotating inspection cycle to ensure all surface water facilities are functioning as designed.

Additionally, in 2009 the City of Shoreline adopted the Department of Ecology Low Impact Development Manual, which requires that best practices be used unless shown to be infeasible.

NPDES Goal #5 – Municipal Operations and Maintenance

This goal requires that the City of Shoreline reduce potential impacts to water quality through its operations and maintenance division of public infrastructure. The Roads Division of the City of Shoreline follows guidance from the ESA Regional Road Maintenance Program Guidelines. The Surface Water Division implements a rigorous stormwater system inspection, maintenance, and cleaning program. The Parks Department adopted an Integrated Pest Management Program. Additionally, all City Maintenance Yards operate under a Surface Water Pollution Prevention Plan (SWPPP) and are regularly inspected to assure compliance with the SWPPP.

A major aspect of this goal is inspecting all municipally owned and operated catch basins and inlets at least once before August 1, 2017. Additionally, the City of Shoreline is committed to using applicable best management practices (BMPs) associated with runoff control during routine maintenance, and using a Work Order software program to track inspections and maintenance/repair activities.

These two goals are applicable to future development within the subarea, in that future growth will require additional infrastructure, both public facilities and private. Through the NPDES permit, it is encouraged to pursue LID improvements to help manage and mitigate surface water runoff. The conventional approach to manage stormwater runoff has limitations for recovering adequate storage and distributed flow paths necessary to more closely match pre-development hydrologic function and protect aquatic resources from adverse effects of development. Low Impact Development principles and applications present a significant conceptual shift from a structural approach to a source reduction approach. LID improvements utilize native soils, vegetation protection areas, and landscaping strategically distributed throughout the project to slow, store, and infiltrate storm flows. LID improvements are designed into the project as amenities, as well as hydrologic controls. Types of LID improvement include vegetated roofs, rainwater harvesting, rain gardens, permeable pavement, and bio-retention swales.

New development within the City of Shoreline will need to conform to regulations within the NPDES Permit and the Ecology LID Manual provisions of the Development Code. Development will be required to utilize LID improvements to reduce flows, infiltrate where applicable, and treat stormwater before discharging to the City of Shoreline's surface water network. The City is required to monitor these facilities to verify they are working properly, and maintain LID improvements installed within public right-of-way, unless an agreement is made with adjacent property owners.

3.5.3 c Other Potential Mitigation Measures

Water

North City Water District

Table 3.5-14 contains a list of distribution and transmission main improvements projected to accommodate future demands associated with each alternative.

The majority of the subarea is located within the North City Water District's 590 pressure zone. While the subarea is currently zoned primarily residential, redevelopment under any of the action alternatives (4, 3, or 2) would introduce more intensive residential uses as well as neighborhoods-supporting commercial/retail. This change in land use would create a substantial increase in demand within this pressure zone.

Table 3.5-14
North City Water District – Water System Upgrades

Alternative	8" Main (Feet)	12" Main (Feet)	Additional Water Storage
#1—No Action	0	0	No
#2—Some Growth	300	4,900	No
#3—Previous Most Growth	300	30,300	Yes
#4—Preferred Alternative	300	37,000	Yes
2035 Improvements	0	8,600	Yes

The North City Water District generated historical and projected water demands for the system, for each pressure zone. **Table 3.5-15** contains a comparison of the 2030 projected demand on the 590 pressure zone based on the existing growth rates, and demand estimated for the study are based on the rezoning alternatives.

According to this comparison, Alternatives 4, 3, and 2 each would generate more demand than the entire pressure zone generates. Major system improvements likely would be necessary to accommodate the influx of demand generation within the North City Water District's portion of the subarea. Improvements to the water system are determined based on projected development growth and land use type.

Table 3.5-15
North City Water District – Demand Comparison

		ADD (MGD)[1]
Pressure Zone 590 - Year 2030		0.41
Subarea	Existing Conditions	0.36
	Alternative 1—No Action	0.39
	Alternative 2—Some Growth	0.77
	Alternative 3—Previous Most Growth	1.77
	Alternative 4—Preferred Alternative	2.66
	2035 Improvements	0.54

1. MGD = Million Gallons per Day

The potential improvements for each alternative are based on a planning level of analysis of the system. Utility providers would need to conduct detailed hydraulic modeling as part of future comprehensive planning/master planning updates to determine specific upsizing and facility improvement needs. The analysis shows the potential demand on the system assuming the subarea is completely built out to the adopted zoning code.

Recommendations are based a conceptual schematic of what improvements likely would be necessary once the subarea is constructed to the limits of the proposed zoning area. Twenty year improvement needs assume that some upsizing to levels that would serve full build-out may be needed. (It is not assumed that the utility providers would continually upgrade facilities multiple times, but rather would install facilities to serve the longest periods of growth possible.) As part of future planning and analysis, utility providers would complete their own analyses to determine the appropriate phasing of improvements in the most efficient manner to serve growth over the next twenty years and beyond.

Alternative 4—Preferred Alternative

Based on a comparison of the necessary effective storage within the 3.7 million gallon storage reservoir, to 2 times the average daily demand for the subarea, additional water storage may be necessary for the full build-out of Alternative 4.The Washington State Department of Health recommends water storage reservoirs to contain standby storage equivalent to two times the system's average daily demand. Two times the average daily demand for Alternative 4 for the North City Water District's portion of the subarea is 5.32 million gallons of recommended storage. The maximum storage currently available is 3.7 million gallons. Additional water storage may be necessary at full build-out of the subarea under Alternative 4.

TAZs 124 and 126 are projected to increase demand by 2,600 percent With the increase in demand, nearly all of the existing 6" water mains may need to be upsized, and dead end mains connected into loop networks to improve pressure distribution and fire flow suppression throughout the North City Water District's portion of the subarea. Similar to Alternative 3, the existing 10" main connecting the western portion of the District's service area with the eastern portion underneath I-5, may need to be increased in diameter to a 12" main or larger to improve flow and distribute pressure through the entire area. The 10" main along 5th Avenue NE may need to be increased to a 12" main, because the area would be changing from an R-6 zone to more intensive zoning. Approximately 37,000 feet of water mains may need to be upsized to 12" diameter or larger mains to serve the projected demands. In addition, the storage reservoirs servicing the applicable pressure zones within the subarea should be analyzed to verify adequate storage is accessible to residents for fire suppression and recommended two-day standby storage if a water source becomes off line.

Twenty Year Improvements

Necessary water storage for the projected twenty year improvements for Alternative 4 is estimated at 1.09 million gallons of standby storage. An analysis of the projected water demand for the subarea combined with the surrounding community was not performed. The existing water storage reservoir may be sufficient to provide water storage to the subarea for the next twenty years; however, a hydraulic analysis will need to be performed.

The total length of pipe potentially necessary to accommodate the projected population in 2035 is approximately 8,600 feet of pipe improvements.

Recommended improvements are based on the assumption that the subarea will eventually be built-out with land uses allowed under the proposed zoning for the preferred alternative. For the purposes of this analysis, it is assumed that infrastructure upsizing to serve the twenty-year 2.5 percent growth rate may include a higher level of improvements. Upsizing may be done to accommodate the Alternative 4—Preferred Alternative at build-out conditions since the utility provider likely would not continuously upsize mains as the population continues to grow, but would upsize for the projected population. With further planning and analysis, the utility provider would determine the most cost effective and efficient method for making improvements to serve growth in the interim years up to the built-out condition.

Estimated improvements needed to serve the next twenty years of growth (but assuming full upsizing to serve build-out) include the following.

1. The following pipes may need to be upsized to 12" diameter pipes to accommodate the projected population in 2035. 12" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4.
    a. 2,130 feet along 5th Avenue NE from N 185th Street to NE 195th Street
    b. 1,330 feet along NE 193rd Street from 1st Avenue NE to 5th Avenue NE
    c. 1,100 feet along NE 192nd Street from 3rd Avenue NE to 5th Avenue NE
    d. 670 feet along NE 189th Street from 8th Avenue NE to 10th Avenue NE
    e. 670 feet along NE 188h Street from 8th Avenue NE to 10th Avenue NE
    f. 1,780 feet along NE 185th Street from 8th Avenue NE, and south along 5th Avenue NE, to NE 180th Street
    g. 920 feet along 7th Avenue NE from NE 183rd Street to NE 180th Street
    h. 210 NE along NE 183rd Street from 7th Avenue NE to 8th Avenue NE
    i. 1,700 feet along NE 180th Street, from 5th Avenue NE to 10th Avenue NE

Alternative 3—Previous Most Growth

Similar to Alternative 4, the projected demand generated from Alternative 3 in comparison to the necessary effective storage within the 3.7 million gallon storage reservoir, additional water storage may be necessary for the full build-out of the alternative. Two times the average daily demand for Alternative 3 for the North City Water District's portion of the subarea is 3.54 million gallons of recommended storage. The maximum storage currently available is 3.7 million gallons. Additional water storage may be necessary at full build-out of the subarea under Alternative 3.

Due to the projected high demands within TAZs 124 and 126, a number of the existing 6" water mains may need to be upsized, and dead end mains connected into loop networks to improve pressure distribution and fire flow suppression throughout the North City Water District's portion of the subarea. The existing 10" main connecting the western portion of the District's service

area with the eastern portion underneath I-5, may need to be increased in diameter to a 12" main to improve flow and distribute pressure through the entire area. The 10" main along 5th Avenue NE may need to be increased to a 12" main, because the area would be changing from an R-6 zone to more intensive zoning. Approximately 30,300 feet of water mains may need to be upsized to 12" diameter to serve the projected demands. In addition, the storage reservoirs servicing the applicable pressure zones within the subarea should be analyzed to verify adequate storage is accessible to residents for fire suppression and recommended two-day standby storage if a water source becomes off line.

Alternative 2—Some Growth

The majority of water mains within the North City Water District's portion of the subarea are 6" water mains. Due to demand generation within a number of the TAZs in the subarea many of the 6" mains may need to be upsized, and connected to the existing 12" transmission mains along NE 180th Street and 12th Avenue NE. Approximately 4,900 feet of mains may need to be upsized to 12" diameter to serve the projected demands. In addition, the storage reservoirs servicing the community should be analyzed to verify that adequate storage is accessible to residents for fire suppression and recommended two-day standby storage if a water source becomes off line.

Alternative 1—No Action

Improvements necessary for Alternative 1 would coincide with the Capital Improvements Plan adopted by the District. No further improvements appear necessary under Alternative 1 – No Action.

Seattle Public Utilities

Table 3.5-16 contains a list of distribution and transmission main improvements projected to accommodate future demands associated with each alternative.

Table 3.5-16
Seattle Public Utilities – Water System Upgrades

Alternative	8" Main (Feet)	12" Main (Feet)
#1—No Action	2,700	0
#2—Some Growth	7,000	13,000
#3—Previous Most Growth	5,700	20,300
#4—Preferred Alternative	5,500	30,500
#4 – 2035 Improvements	1,500	3,000

Alternative 4—Preferred Alternative

Alternative 4—Preferred Alternative would generate more demand throughout the subarea. Concentration would no longer be just along NE 185th Street, but would affect nearly all side streets and expand past the limits of the subarea within TAZs 7, 123, and 34. Upsizing mains and connecting dead end mains should occur for nearly every dead end fire hydrant under this alternative. Approximately 5,500 feet of water mains may need to be upsized to 8" diameter, and 30,500 feet of mains may need to be upsized to 12" diameter to serve the projected demands.

Twenty Year Improvements

As with recommended improvements for the North City Water District, this analysis assumes upsizing would occur to accommodate the twenty-year estimated annual 2.5 percent growth rate. The distribution system and facilities could be potentially upsized as necessary to accommodate Alternative 4 – Preferred Alternative at build-out conditions. Because it is not likely that that the utility provider would continuously upsize their mains as the population continues to grow, but would upsize at some point for the projected population. With further planning and analysis, each utility provider would further determine how improvements could be made more cost effectively in the interim years before build-out.

Water improvements in the Seattle Public Utilities system anticipated to serve the projected population in 2035 under any of the action alternatives (but typically inclusive of upsizing to serve full build-out) are described below.

The total length of pipe potentially necessary to accommodate the projected population in 2035 is approximately 4,500 feet of pipe improvements.

1. An analysis based solely on projected population growth and per capita demand projections, estimates the following pipe diameters may need to be upsized to 8" diameter pipes to accommodate the projected population in 2035. Under total build-out of Preferred Alternative #4, these pipe diameters may need to be upsized to 12" diameter pipes.
    a. 890 feet along Sunnyside Avenue N from the north end to N 180th Street
    b. 240 feet along N 186th Street from east end to Corliss Avenue N

2. The following pipes may need to be upsized to 8" diameter pipes to accommodate the projected population in 2035. 8" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4.
    a. 180 feet along N 185th Court to the intersection with Midvale Avenue N.
    b. 170 feet along N 187th Street from west end to 1st Avenue NE

3. The following pipes likely would need to be upsized to 12" diameter pipes to accommodate the projected population in 2035 (12" diameter or larger pipes may be necessary to serve build-out of Preferred Alternative 4).
    a. 1,160 feet along 3rd Avenue NE from N 185th Street to NE 180th Street to connect the pipe network into a loop
    b. 650 feet along Ashworth Avenue N, from N 185th Street to N 183rd Street
    c. 650 feet along 1st Avenue NE from N 187th Street to N 185th Street
    d. 560 feet along NE 180th Street from 3rd Avenue NE to 1st Avenue NE
    e. 170 feet along 3rd Avenue NE from north end to NE 185th Street

Alternative 3—Previous Most Growth

Similar to Alternative 2—Some Growth, demand generation under Alternative 3—Previous Most Growth would be concentrated along NE 185th Street, where rezoning would change the area

from an R-6 to an MUR-45 zone. The majority of water main upsizing would be mains stemming off the existing 30" transmission main along NE 185th Street. Upsizing of mains would especially be necessary adjacent to TAZ 38, where the largest increase in water demand is projected. A 6" distribution main along NE 183rd Street may need to be upsized to an 8" or 12" main due to the zoning increase from R-6 to R-48. Approximately 5,700 feet of water mains may need to be upsized to 8" diameter, and 20,300 feet of mains may need to be upsized to 12" diameter to serve the projected demands.

Alternative 2—Some Growth

Demand generation would be concentrated along NE 185th Street. The majority of water main upsizing would be mains stemming off the existing 30" transmission main along NE 185th Street to accommodate the rezoning from R-6 to more intensive zoning. Upsizing of mains would especially be necessary adjacent to TAZ 38, where the largest increase in water demand is projected. A 6" distribution main along NE 183rd Street may need to be upsized to an 8" main to accommodate demands within the subarea. A number of the dead end distribution mains within TAZ 36 are 4" diameter pipes. In order to accommodate projected demand increases along the southern half of this zone, many of these mains should be upsized to 8" water mains. Approximately 7,000 feet of water mains should be upsized to 8" diameter, and 13,000 feet of mains should be upsized to 12" diameter to serve the projected demands.

Alternative 1—No Action

Approximately 2,700 feet of water mains may need to be upsized to 8" mains or connected into a loop system to provide suitable fire suppression to two fire hydrants in TAZ 132.

Wastewater

Table 3.5-17 contains a list of sewer main improvements projected to accommodate future demands associated with each alternative.

Table 3.5-17
Ronald Wastewater District – System Upgrades

Alternative	12" to 15" Main[1]	18" or Larger Main[2]	Upsize Lift Station #
#1 — No Action	0	0	None
#2 — Some Growth	11,300 ft	0	15
#3 — Previous Most Growth	11,300 ft	20,800 ft	8, 14, 15
#4 — Preferred Alternative	26,600 ft	32,500 ft	8, 14, 15
2035 Improvements	648 ft	10,100 ft	15

Alternative 4—Preferred Alternative

Alternative 4—Preferred Alternative is projected to increase demand throughout the subarea. Approximately 26,600 feet of

12" diameter pipe and 32,500 feet of 18" diameter pipe may need to be installed in new runs or upsized from existing 8" diameter mains to accommodate projected flows from the estimated population under Alternative 4.

A trunk main collects wastewater from the majority of the subarea, from as far north as NE 190th Street, as far west as Ashworth Avenue N, and as far east as 15th Avenue N. This trunk main is the main sewer main for basin #23 within the Ronald Wastewater District. The sewer main begins at NE 185th Street and Meridian Avenue NE as a 24" main. Under peak hour conditions, it is estimated that this trunk main can collect as much as 13.6 cfs from the subarea under build-out conditions of Alternative 4. The 24" trunk main was assumed to be of adequate size to handle this capacity, though with additional flows from outside of the subarea, the pipe will need to be analyzed to verify it's flow capacity. At NE 161st Place and Corliss Avenue NE, the pipe reduces in diameter to an 18" pipe, to the intersection of NE 155th Street. Approximately 1,660 feet of pipe may need to be upsized to 24" or larger diameter pipe to accommodate the projected flows from the subarea and the surrounding community.

Sewer improvements are projected along most side streets, including upsizing 3,100 feet of 8" mains upsized to 18" mains along Corliss Avenue N and Meridian Avenue N, from N 194th Street to N 185th Street, and 10,400 feet of pipe upsized to 12" mains along all side streets and cul-de-sacs from Meridian Avenue N to 5th Avenue NE. Major pipe improvements are projected along N 185th Street to accommodate the increase in demand, including upsizing 2,800 feet of pipe from 8" pipe to 18" diameter pipe from Stone Avenue N to 1st Avenue NE, and 3,300 feet of 8" pipe to 18" diameter pipe along Ashworth Avenue N, from N 185th Street to N 175th Street.

The increased demand in TAZ 126 and 127, may require upsizing approximately 2,000 feet of pipe along NE 180th Street to 18" pipe, including upsizing the sewer connection under I-5.

Sections of sewer along NE Serpentine Place may need to be upsized to 18" diameter pipe if the region will be rezoned to R-48.

Under Alternative 4 – Preferred Alternative TAZs 34, 36, and 38 are hydraulically connected and are projected to generate a flow rate of 9.07 cfs. The improvements will be the same as Alternative 3, approximately 5,100 feet of 8" diameter sewer pipes will need to be upsized to 18" or greater diameter pipe network to handle the increase in flow, and additional 2,000 feet of 8" main would need to be upsized to 12" to 15" diameter pipe.

The zones draining to Lift Station #15 will generate a peak flow of approximately 9.9 cfs, or 4,447 gpm, which exceeds the pump's capacity. This may require upsizing Lift Station #15. Additionally to accommodate the forecasted flow, approximately 1,500 feet of 8" diameter pipe may need to be upsized to 18" or larger diameter pipe, and 650 feet of 8" diameter may need to be upsized to 12" to 15" diameter pipe. Similar to Alternative 3, upsizing Lift Station #15, may require upsizing of the force main and gravity lines downstream from the lift station, outside of the subarea. Hydraulic modeling will need to be completed for any proposed improvements based on the changed land use designations.

Lift Station #8 is located just north of the subarea, but is partially fed by lots within TAZ 37. Under Alternative 4, there is potential that 5.0 cfs or 2,270 gpm of peak flow would be generated from TAZ 37. Lift Station #8 has a pump capacity of 100 gpm with 39 feet of head. This may require upsizing Lift Station #8 and the surrounding force mains to accommodate forecasted flow.

Lift Station #14 may see an increase in peak flow up to 374 gpm, which exceeds the pump capacity. The lift station may need to be upsized to accommodate the projected flows forecasted from Alternative 4.

Twenty Year Improvements

The total length of wastewater improvements potentially necessary to accommodate the projected population in 2035 is approximately 10,100 feet of pipe improvements. The improvements include the following:

1. An analysis based solely on projected population growth and per capita demand projections, estimates the following pipe diameters may need to be upsized to 12" diameter pipes to accommodate the projected population in 2035. Under total build-out of Preferred Alternative #4, these pipe diameters may need to be upsized to 18" diameter pipes:
    a. 1,300 feet of pipe along N 185th Street, from Meridian Avenue N to 1st Avenue NE.
    b. 1,900 feet of pipe along 1st Avenue NE, from N 18^{8th} Street to N 18^{0th} Street.
    c. 2,000 feet of pipe along 3rd Avenue NE, from NE 185th Street to NE 180th Street, and NE 180th Street, from 3rd Avenue NE to 1st Avenue NE.
    d. 1,500 feet of pipe along 8th Avenue NE from 188th St to NE 185th Street and along NE 185th Street from 8th Avenue NE to Lift Station #15 on 12th Avenue NE

2. The following pipes may need to be upsized to 18" diameter pipes to accommodate the projected population in 2035. 18" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4:
    a. 2,700 feet of pipe along 5th Avenue NE

3. The following pipes may need to be upsized to 12" diameter pipes to accommodate the projected population in 2035. 12" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4:
    a. 650 feet of pipe along 8th Avenue NE, from NE 190th Street to NE 188th Street

4. Lift Station #15 may need to be upsized to accommodate estimated demand for the projected population in 2035. The 2035 population is projected to increase demand to this lift station to approximately 904 gpm. Under total build-out of Preferred Alternative #4, the projected demand flow would increase would be 4,450 gpm.

Alternative 3—Previous Most Growth

Alternative 3 is projected to increase demand throughout the subarea. Approximately 11,300 feet of 12" diameter pipe and 20,800 feet of 18" diameter pipe may need to be installed in new runs or upsized from existing 8" diameter mains to accommodate projected flows from the estimated population under Alternative 3.

The trunk main that collects wastewater from basin #23 is projected to collect as much as 11.70 cfs from the subarea under build-out conditions of Alternative 3. Similar to Alternative 4, the 24" trunk main was assumed to be of adequate size to handle this capacity under Alternative 3, though with additional flows from outside of the subarea, the pipe will need to be analyzed to verify it's flow capacity. The 1,660 feet of 18" diameter pipe along Corliss Avenue NE from NE 161st Street to NE 155th may need to be upsized to 24" or larger diameter pipe to accommodate the projected flows from the subarea and the surrounding community.

Similar to Alternative 2—Some Growth, TAZs 34, 36, and 38 under Alternative 3—Previous Most Growth are hydraulically connected to the same sewer drainage basin. Under Alternative 3, the peak sewer flow rate would be 9.69-cfs. Approximately 5,100 feet of 8" diameter sewer pipes may need to be upsized to 18" or greater diameter pipe network to handle the increase in flow, and additional 2,000 feet of 8" main may need to be upsized to 12" or 15" diameter pipe.

TAZs 124, 126, and half of zones 40, 65, and 125 would create an estimated peak flow of 8.1 cfs, or 3,626 gpm. This may require upsizing Lift Station #15. Additionally to accommodate the forecasted flow, approximately 5,200 feet of 8" diameter pipe may need to be upsized to 18" or larger diameter pipe, and 6,500 feet of 8" diameter may need to be upsized to 12" to 15" diameter pipe. Similar to Alternative 2, upsizing Lift Station #15, may require upsizing of the force main and gravity lines downstream from the lift station, outside of the subarea. Hydraulic modeling will need to be completed for any proposed improvements based on the changed land use designations.

Lift Station #8 is located just north of the subarea, but is partially fed by lots within TAZ 37. Under Alternative 3, there is potential that 1.2 cfs or 546 gpm of peak flow would be generated from TAZ 37. Lift Station #8 has a pump capacity of 100 gpm with 39 feet of head. This may require upsizing Lift Station #8 and the surrounding force mains to accommodate forecasted flow.

Lift Station #14 primarily serves residents outside of the subarea; however, due to its proximity to a proposed rezoning area, the lift station may be affected by rezoning that could occur under Alternative 3. The majority of TAZ 79 and a quarter of TAZ 127 discharges to Lift Station #14. Currently, Lift Station #14 has a pump rate of 240-gpm at 37 feet of head. The estimated combined demand entering the lift station would be approximately 170 gpm under peak conditions. Although the lift station appears to be sized correctly for forecasted demands, Lift Station #14 should be analyzed with the level of growth forecasted under Alternative 3.

Other potential improvements include upsizing approximately 2,000 feet of pipe along NE 180th Street to 12" pipe, including upsizing the sewer connection under I-5; upsizing, approximately 2,300 feet of pipe along 15th Avenue NE, south of 177th Avenue NE; and upsizing approximately 2,500 feet of existing pipe along 7th Avenue NE and 9th Avenue NE, from NE 180th St to NE 185th Street.

Alternative 2—Some Growth

TAZs 34, 36 and 38 are connected to the same sewer drainage basin. Based on demand analysis within the Ronald Wastewater District's Comprehensive Plan, a multiplier of four was applied to the average daily demand to convert to the peak amount

projected to enter the system at one time. The peak flow within this pipe network is projected to be 2.5675 cfs of wastewater. According to Table 28.3 of the Civil Engineering reference Manual, 12th Edition, an 8" diameter pipe flowing full at a minimum slope can handle 0.771 cfs. Approximately 7,800 feet of 8" diameter sewer pipes may need to be upsized to 12" to 15" diameter pipes to handle the increase in flow.

TAZs 124, 126, and half of zones 40, 65 and 125 enter into Lift Station #15 within the system. The estimated peak flow would be 735 gpm from these zones. The existing lift station has a max flow rate of 550-gpm. Although the entire projected demand may not discharge into this lift station, Lift Station #15 may be undersized if Alternative 2 is implemented. Additionally, the lift station's overflow line terminates at the proposed site of the Link Light Rail Station. Modifications may be necessary to the lift station location and size under Alternative 2, 3, or 4. Additionally, 2,800 feet of 8" diameter pipe may need to be upsized to 12" diameter pipe to assist with the sewer flow from the lift station. Upsizing Lift Station #15 may require upsizing of the force main and gravity lines downstream from the lift station, outside of the subarea. Hydraulic modeling will need to be completed for any proposed improvements based on the changed land use designations.

Other potential improvements include upsizing approximately 2,300 feet of pipe along 15th Avenue NE, south of 177h Avenue NE, and 700 feet of pipe along 8th Avenue NE, from NE 180th St to NE Serpentine Place.

Alternative 1—No Action

Potential demand generation from the Alternative 1—No Action would create a 15 percent increase in wastewater generation. No pipe upsizing other than what is proposed within the Comprehensive Plan should be necessary to accommodate future growth. No costs are associated with the adoption of Alternative 1.

Surface Water

Table 3.5-18 contains a list of surface water facilities projected to manage future runoff and increased impervious surface associated with development from each alternative.

Table 3.5-18
Surface Water System Upgrades

Alternative	12" Pipe[1]	18" Pipe[2]	24" Pipe[3]	Pump Station Upsizing
#1 — No Action	0	0	0	0
#2 — Some Growth	15,300	8,800	0	MC03
#3 — Previous Most Growth	22,100	17,300	0	MC03 & Serpentine Pump Station
#4 —Preferred Alternative	11,300	35,700	4,300	MC03 & Serpentine Pump Station
2035 Improvements	4,300	20,400	2,600	MC03

Alternative 4—Preferred Alternative

Many of the existing streets currently contain ditches and swales at the edges of the roadway. When new developments are constructed within the subarea, streets would be improved to

accommodate the added influx of users. When this occurs, some of the open ditches may be converted to a closed pipe network. There is also the possibility that low impact development (LID) treatments such as bioswales, stormwater planters, rain gardens and/or other features may reduce the need for pipe replacement and upsizing,

Approximately 51,300 feet of new or upsized pipe may be needed to handle projected surface water runoff from future development. Similar to Alternative 3, the two pump stations may receive additional flow from the surrounding developments.

Under Alternative 2, 3, or 4, there could be an opportunity to study and implement a regional stormwater facility project that would serve future growth. This project could include construction of a regional system of facilities funded through grants and capital improvement planning. Providing regional facilities can help to catalyze redevelopment by reducing costs of stormwater infrastructure improvements to individual site development, similar to several other examples in the region, including the Overlake Village Light Rail Station area in Redmond. Individual developments would be required to provide water quality treatment, but detention and flow control could be handled by the regional facilities.

Additionally, implementation of LID and green stormwater infrastructure solutions as part of public right-of-way improvements as well as onsite development would have a beneficial effect in reducing impacts in the subarea by enhancing stormwater treatment and management.

Twenty Year Improvements

The total length of surface water pipe improvements potentially necessary to accommodate the projected population in 2035 is approximately 27,300 feet of pipe. The improvements include the following:

1. An analysis based solely on projected population growth and per capita demand projections, estimates the following pipe diameters may need to be upsized to 18" diameter pipes to accommodate the projected population in 2035. Under total build-out of Preferred Alternative #4, these pipe diameters may need to be upsized to 24" diameter pipes:
    a. 570 feet along N 185th Street, from Stone Avenue to Ashworth Avenue
    b. 1,080 feet along N 185th Street, from Densmore Avenue to Burke Avenue
    c. 970 feet along Wallingford Avenue, from N 185th Street to N 188th Street

2. The following pipes may need to be upsized to 18" diameter pipes to accommodate the projected population in 2035. 18" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4:
    a. 450 feet along N 185th Street, from Densmore Avenue to Wallingford Avenue
    b. 600 feet along Densmore Avenue, from N 185th Street to N 188th Street
    c. 930 feet along Burke Avenue, from N 185th Street to N 188th Street
    d. 500 feet along N 185th Street, from Meridian Avenue to Corliss Avenue

e. 240 feet along Corliss Avenue, from N 184th Street to N 185th Street
f. 920 feet along Bagley Place N, from N 187th Street to N 185th Street
g. 620 feet along N 180th Street, from 1st Avenue NE to Cromwell Park
h. 1,530 feet along 3rd Avenue NE, from the north end to NE 180th Street, continue along NE 180th Street to 1st Avenue NE
i. 820 feet along 2nd Avenue NE, from the north end to NE 180th Street
j. 890 feet along N 185th Street, from Sunnyside Avenue to 3rd Avenue NE
k. 350 feet along 2nd Avenue NE, from the south end to N 185th Street
l. 350 feet along 3rd Avenue NE, from the south end to N 185th Street
m. 3,900 feet along 5th Avenue NE, from N 185th Street to NE 195th Street
n. 570 feet along N 185th Street, from 3rd Avenue NE to 5th Avenue NE
o. 680 feet along NE 190th Street, from 8th Avenue NE to 10th Avenue NE
p. 1,320 feet along 10th Avenue NE, from NE 190th Street to NE 185th Street
q. 650 feet along NE 185th Street, from 10th Avenue NE to 8th Avenue NE, and south along 8th Avenue NE to NE 183rd Street
r. 250 feet along 9th Avenue NE, from the south end to NE 185th Street
s. 250 feet along 10th Avenue NE, from the south end to NE 185th Street
t. 1,480 feet along NE 180th Street, from 15th Avenue NE to 10th Avenue NE
u. 270 feet along 14th Avenue NE, from the north end to NE 180th Street

3. The following new 12" diameter pipe runs may need to be installed to accommodate the projected population in 2035. 12" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4:
   a. 400 feet along N 184th Street, from the east end to Corliss Avenue
   b. 1,310 feet along 8th Avenue NE, from NE 190th Street to NE 188th Street, and east along NE 188th street to 10th Avenue NE
   c. 670 feet along NE 189th Street, from 8th Avenue NE to 10th Avenue NE
   d. 310 feet along NE 182nd Street, from 10th Avenue NE to 11th Avenue NE
   e. 1,200 feet along 7th Avenue NE, from the north end to NE 180th Street
   f. 370 feet along 5th Avenue NE, from NE 185th Street to the connection with the existing pipe

4. The following new 12" diameter pipe runs may need to be installed to accommodate the projected population in 2035. 18" diameter or larger pipes may be necessary under total build-out of Preferred Alternative #4:
   a. 720 feet along 8th Avenue NE, from the south end to NE 185th Street
   b. 800 feet along 9th Avenue NE, from the south end to NE 185th Street

c. 800 feet along 10th Avenue NE, from the south end to NE 185th Street
d. 550 feet along 6th Avenue NE, from the north end to NE 180th Street

5. Pump Station MC03 likely would need to be upsized to accommodate estimated demand for the projected population in 2035. (Note: MC03 is also called Pump Plant 26 by some data sources. It is located on the south side of NE 185th Street, between 9th Avenue NE and 10th Avenue NE.)

Alternative 3—Previous Most Growth

Approximately 39,400 feet of new or upsized pipe may be needed to handle projected surface water runoff from future development. Two pump stations may receive additional flow from the surrounding developments, Pump Station MC03 and the Serpentine Pump Station. Since the Serpentine Pump Station is already projected to be improved due to flooding issues, the design may need to be reanalyzed for future flows.

Alternative 2—Some Growth

TAZ 38 currently contains a large infiltration field. If this zone is projected to be redeveloped as projected in either Alternative 2—Some Growth, Alternative 3—Previous Most Growth, or Alternative 4—Preferred Alternative, there may not be room for the infiltration field. An alternative flow control facility and upsizing connecting surface water pipes from the existing 12" diameter pipes may be required.

Under Alternative 2—Some Growth, approximately 15,000 feet of 12" or larger pipe may need to be installed. Improvements would not be limited to pipe installation, but would need to include catch basins, and detention/treatment facilities. Pump Station MC03 may need to be upsized in order to receive additional flows from TAZ 126.

In total, approximately 24,100 feet of new or upsized pipe may be needed to accommodate future growth within the subarea, to handle added surface water runoff from future development.

Alternative 1—No Action

Since Alternative 1—No Action would contain the same zoning as under existing conditions, no additional surface water runoff is projected within the subarea, and no additional improvements except those described in Section 3.5.3.a would be necessary. However, it should be noted that creation of new households or infill redevelopment could occur under Alternative 1—No Action. New sites and households would be required to manage stormwater related to individual redevelopment, even though there would be no capital improvements at a larger scale.

Electricity

Although no data was made available for Seattle City Light's existing distribution network, primary improvement to the system would be undergrounding existing overhead lines when new developments are constructed within the subarea, as feasible.

Alternative 4—Preferred Alternative Build-Out

The majority of the subarea would see a substantial increase in energy use under Alternative 4 at build-out, but this would occur

gradually over many decades. TAZs 40, 124, 126, and 127 would not need much upsizing of the distribution lines due to their proximity to the Seattle City Light transmission corridor. No issues are anticipated in acquiring the additional energy supply to serve these zones. Zones west of I-5 are located further from the Seattle City Light transmission corridor and may require upsized distribution lines and transformers to adequately serve these areas.

Alternative 3—Previous Most Growth

The primary energy demand increase would occur in TAZs 7, 10, 11, 38, 124, and 126. Similar to Alternative 2, TAZs 124 and 126 would not need much upsizing of the distribution lines due to their proximity to the Seattle City Light transmission corridor. It should be relatively easy to acquire additional energy supply to these zones. Zones 7, 10, 11, and 38, may require additional distribution lines and transformers to adequately serve these areas.

Alternative 2—Some Growth

The primary energy demand increase would occur in TAZs 7, 10, 38, 124, and 126. The Seattle City Light transmission corridor runs through TAZs 124 and 126. It should be relatively easy to acquire additional energy supply to these TAZs. TAZs 7, 10, and 38, may require additional distribution lines and transformers to adequately serve these areas.

Alternative 1—No Action

The primary energy demand increase would occur in TAZ 7. Additional distribution lines and transformers may need to be installed to adequately service this area.

Natural Gas

No data was provided to support analysis of demand for Puget Sound Energy natural gas. Puget Sound Energy is a privately owned company. All improvements are based on future customer requests, and funding for future growth would be financed by customer fees within the region. Because natural gas is readily available to the area, it is not anticipated that there would be any issues in extending service to serve future growth.

Energy Efficiency Considerations

Related to energy use, including electricity and natural gas, technological advancements in building systems and design are improving efficiency on an ongoing basis. New developments are more commonly integrating green building and alternative energy systems (solar, geothermal, etc.), as well as more energy efficient design and fixtures. These approaches will maximize energy conservation and help the region and city achieve Climate Action Plan goals, in addition to reducing impacts on energy providers. The City intends to explore the potential implementation of district energy and encourage combined heat and power systems with redevelopment as called for in the Subarea Plan policies. The City also intends to pursue a solarization program, community solar, or other innovative ways to partner with local businesses and organizations to promote installation of photovoltaic systems.

Communications

No data was provided for any of the communication companies' distribution networks. The primary improvement to the system would be undergrounding existing overhead lines when new developments are constructed within the subarea. All communication networks are privately owned entities. Funding to

serve future growth would be financed by customer fees within the region. As such, there would not be adverse impacts associated with providing communication services in the future under any of the alternatives.

Considerations Related to Redevelopment in Both Station Subareas

The 145th Street EIS Report and 185th Street EIS Report were analyzed as standalone rezoning alternatives. Depending on which alternative is selected for each subarea, the resultant zoning would have a combined effect on the supporting infrastructure.

Water—North City Water District

The primary concern with the combined effect of both subareas on the existing system is the North City Water District's current approved rate of withdrawal from Seattle Public Utility's Tolt River Transmission Main. The current approved maximum withdrawal rate from the transmission main is 3,300 gallons per minute. **Table 3.5-19** provides a comparison of the two study areas to the maximum withdrawal rate.

This analysis does not include demand from the rest of the North City Water District, which relies on this withdrawal rate as well. Based only on the two subareas, if the highest population density zoning alternatives are selected for both subareas, the North City Water District will have a deficit in their water withdrawal rate. Prior to build-out of the selected alternative, the North City Water District will need to coordinate with Seattle Public Utilities to acquire additional water withdrawal from the Tolt River Transmission Main.

Table 3.5-19—North City Water District Source of Supply Analysis for Both Alternatives

North City Water District Maximum Withdrawal Rate (GPM)				
3,300				
145th Street Subarea				
Existing Conditions (GPM)	Alt 1 (GPM)	Alt 2 (GPM)	Alt 3 (GPM)	
251	374	1,338	1,507	
185th Street Subarea				
Existing Conditions (GPM)	Alt 1 (GPM)	Alt 2 (GPM)	Alt 3 (GPM)	Alt 4 (GPM)
249	274	536	1,228	1,846

Currently, both the 145th Street Subarea and 185th Street Subarea are within the 590 Pressure Zone, and fed by the same supply stations, booster pumps, and storage reservoir. If the highest population density zoning alternatives are selected for both subareas, all connecting appurtenances will need to be analyzed in conjunction with the demand generated from the surrounding community. If the new pressure zone, 515 is constructed around the 145th Street Subarea, the two subareas will no longer be connected, and the only resource used by both communities would be the 3.7-million gallon storage reservoir located near the intersection of 15th Avenue NE and NE 177th Street.

This reservoir currently serves the 615 and 590 pressure zones, and would serve as backup storage for the proposed 515 Pressure Zone. The reservoir would still need to supply standby storage of two times the average daily demand for all three pressure zones. **Table 3.5-20** contains a comparison of maximum available storage within

the reservoir to two times the average daily demand for both subareas under each scenario. Based on this information, the storage reservoir may be undersized for full build-out of the highest population density zoning alternative selected for both subareas.

Table 3.5-20
North City Water District - Standby Storage Analysis

North City Water District Available Effective Storage (Millions of Gallons)[1]				3.7
145th Street Subarea - Average Daily Demand x 2				
Existing Conditions - 2 x ADD (MGPD)[2]	Alt 1 - 2 x ADD (MGPD)	Alt 2 - 2 x ADD (MGPD)	Alt 3 - 2 x ADD (MGPD)	
0.72	1.08	3.85	4.34	
185th Street Subarea - Average Daily Demand x 2				
Existing Conditions - 2 x ADD (MGPD)	Alt 1 - 2 x ADD (MGPD)	Alt 2 - 2 x ADD (MGPD)	Alt 3 - 2 x ADD (MGPD)	Alt 4 - 2 x ADD (MGPD)
0.72	0.79	1.54	3.54	5.32

1.) Effective Storage was taken as the entire volume of the 3.7 million gallon Reservoir, assuming nested standby and fire suppression storage, and not factoring in equalizing storage for the purposes of this report.
2.) Million Gallons Per Day (MGPD)

Water—Seattle Public Utilities

Similar to the North City Water District, the Seattle Public Utilities portion of both subareas are within its own 590 Pressure Zone, and fed by the same supply stations, booster pumps, and storage reservoir. Due to the extensive nature of the Seattle Public Utilities water system, a proper analysis could not be performed between the two subareas and connecting appurtenances. Once the desired alternatives have been selected, the hydraulic model should be updated to properly evaluate all supply stations, booster pumps, and reservoirs connected to the system. **Table 3.5-21** provides a side by side analysis of the two study areas water demand rates.

Table 3.5-21—Seattle Public Utilities
Combined Subarea Water Demand Analysis

145th Street Subarea					
	Existing Conditions	Alt 1	Alt 2	Alt 3	
Withdrawal Rate (GPM)	228	269	958	783	
Recommended Storage (MGPD)	0.66	0.78	2.76	2.26	
185th Street Subarea					
	Existing Conditions	Alt 1	Alt 2	Alt 3	Alt 4
Withdrawal Rate (GPM)	216	244	813	1,644	1,710
Recommended Storage (MGPD)	0.62	0.70	2.34	4.74	4.92

Wastewater

The primary concern with the combined effect of both subareas on the existing system is an analysis of the prime trunk main collecting wastewater from both subareas. The majority of both subareas

collect wastewater within basin #23. The main trunk main begins in the 185th Street subarea, as a 24" diameter pipe, collecting wastewater from as far north as NE 190th Street, as far west as Ashworth Avenue N, and as far east as 15th Avenue N. This trunk main continues along Meridian Avenue N, Corliss Avenue N, and along the I-5 Corridor, collecting wastewater from a large portion of the City of Shoreline as it heads south. The trunk main turns into a 30" main at the intersection of NE 155th Street and I-5, as it enters the 145th Street Subarea. **Table 3.5-22** provides a comparison of the estimated peak flow (four times the average daily demand) for the two subareas entering this trunk main.

Table 3.5-22—Ronald Wastewater, Basin #23 Combined Subarea Peak Wastewater Estimated Flow Analysis

145th Street Subarea				
Existing Conditions (CFS)	Alt 1 (CFS)	Alt 2 (CFS)	Alt 3 (CFS)	
3.04	3.96	14.36	13.38	
185th Street Subarea				
Existing Conditions (CFS)	Alt 1 (CFS)	Alt 2 (CFS)	Alt 3 (CFS)	Alt 4 (CFS)
2.24	2.50	3.93	11.70	13.58

This analysis does not include demand from the rest of Basin #23, which drains into this trunk main. Based only on the two subareas, if the highest population density zoning alternatives are selected for both subareas, the Ronald Wastewater District may need to upsize a large portion of this pipe. Additionally, this pipe enters the Seattle Public Utilities District once it crosses NE 145th Street. SPU will need to evaluate the capacity of this pipe once it enters their system, based on the projected demand from the selected alternatives.

3.5.4 Significant Unavoidable Adverse Impacts

Increased demand for utilities services and facilities within the subarea would occur under all four alternatives, with Alternative 4 generating the most demand at build-out, followed by Alternative 3, Alternative 2, and then Alternative 1. Existing deficiencies within the water, wastewater, surface water, electricity, and communications service areas would need to be addressed over time as the subarea grows in population, households, and businesses.

Growth and change would be expected to occur gradually over many decades under any of the four action alternatives. Implementation of full build-out of Alternative 4—Preferred Alternative would take 80 to 125 years. Alternative 3—Previous Most Growth would take 60 to 100 years to reach full build-out, and Alternative 2—Some Growth would take an estimated 30 to 50 years. As such, utility service providers would be able to monitor growth and adapt management, services, and facilities to serve increases in demand over time, assuming that funding keeps pace with growth. Given these long timeframes, it is also likely that technological innovations, behavioral changes, and more stringent building and energy codes may also mitigate impacts related to utilities. Energy efficiency may be achieved through combined heat and power systems, possible district energy, the potential use of solar power and/or geothermal, and other applications. With application of the capital improvement projects discussed, along with regulatory requirements, no significant unavoidable adverse impacts would be anticipated.

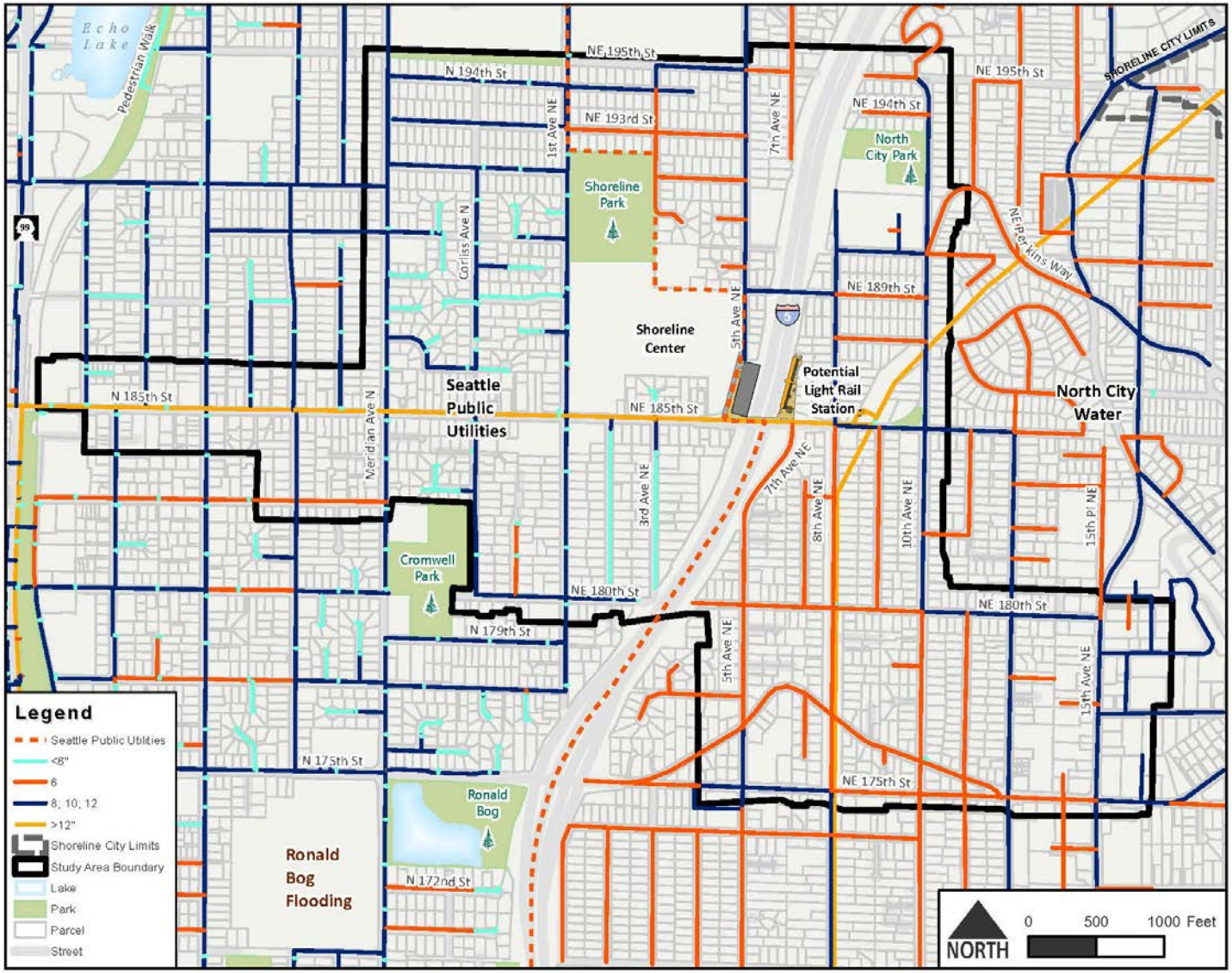


Figure 3.5-1 Existing Water Facilities in the Subarea

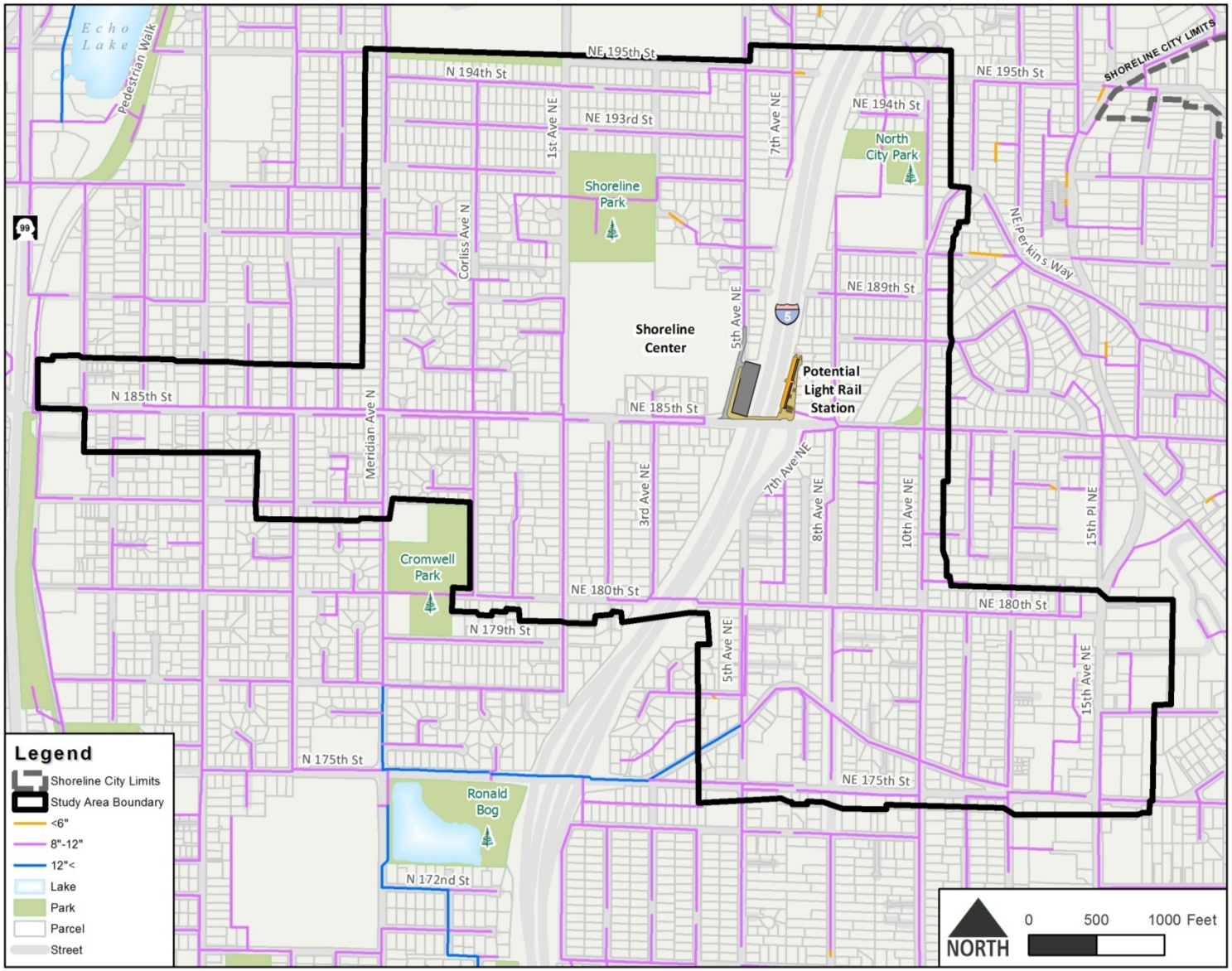


Figure 3.5-2 Existing Wastewater Facilities in the Subarea

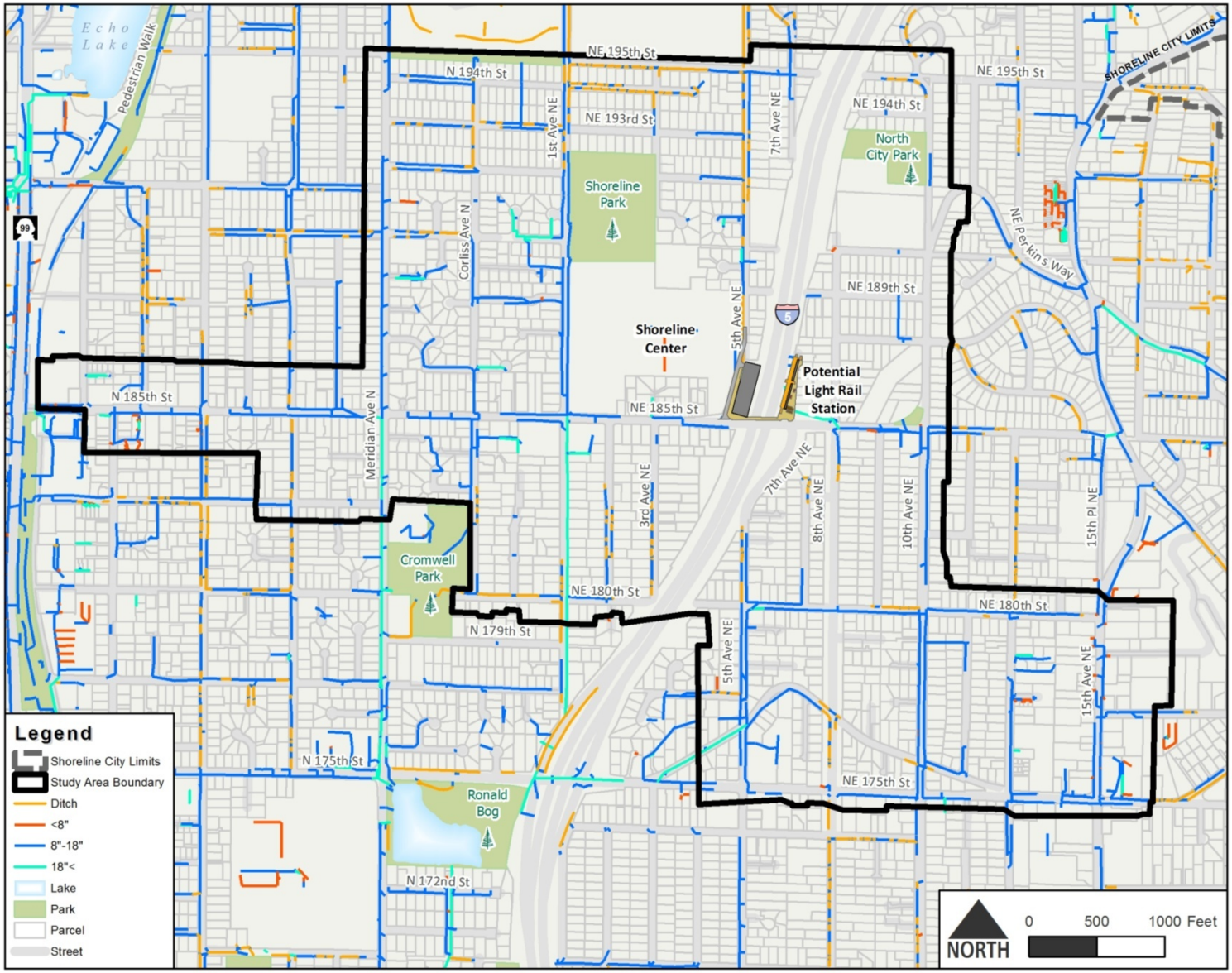


Figure 3.5-3 Existing Surface Water/Stormwater Facilities in the Subarea

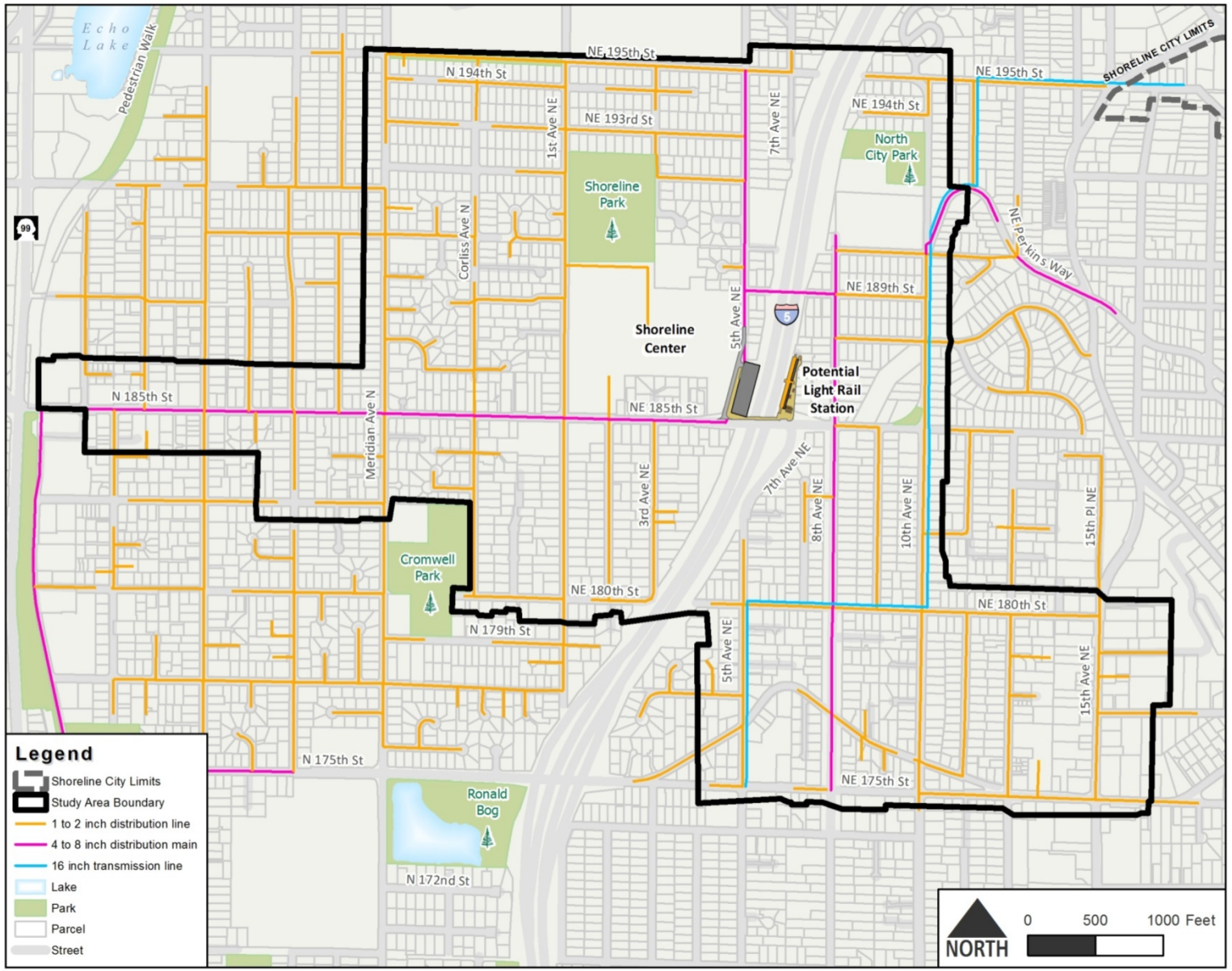


Figure 3.5-4 Existing Natural Gas Lines in the Subarea

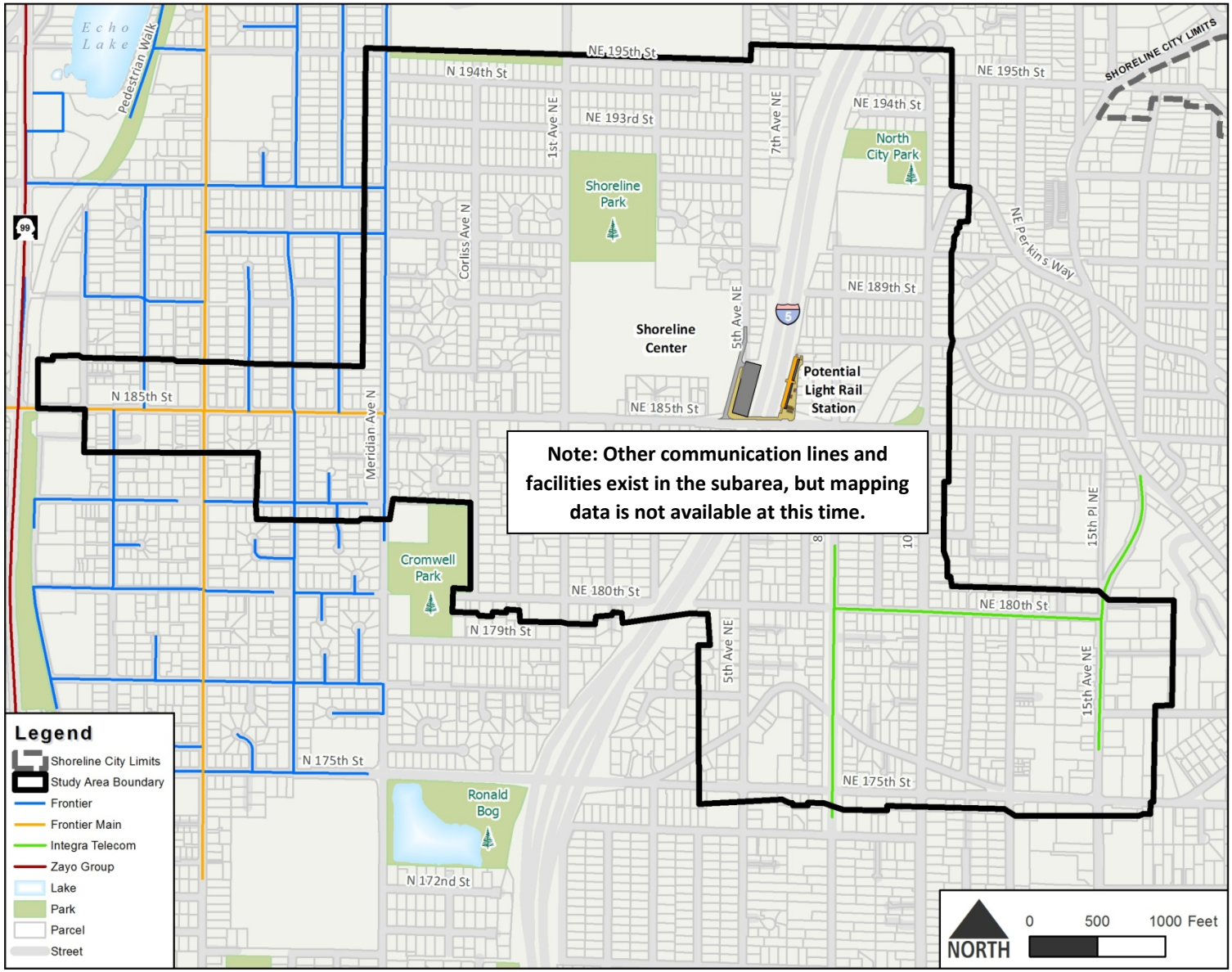


Figure 3.5-5 Communications Facilities (Partial) in the Subarea

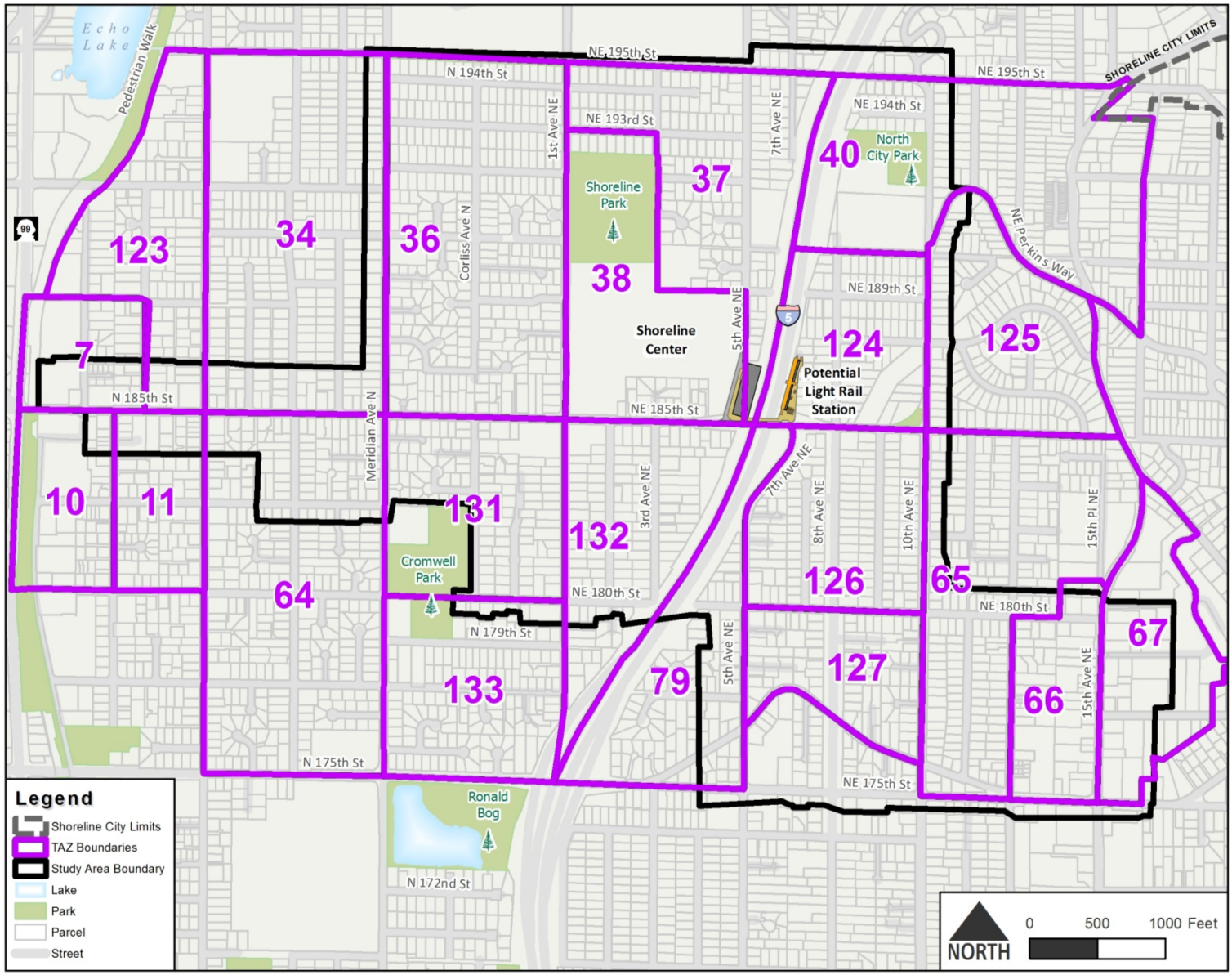


Figure 3.5-6 Traffic Analysis Zones (TAZs) in Proximity to the Subarea

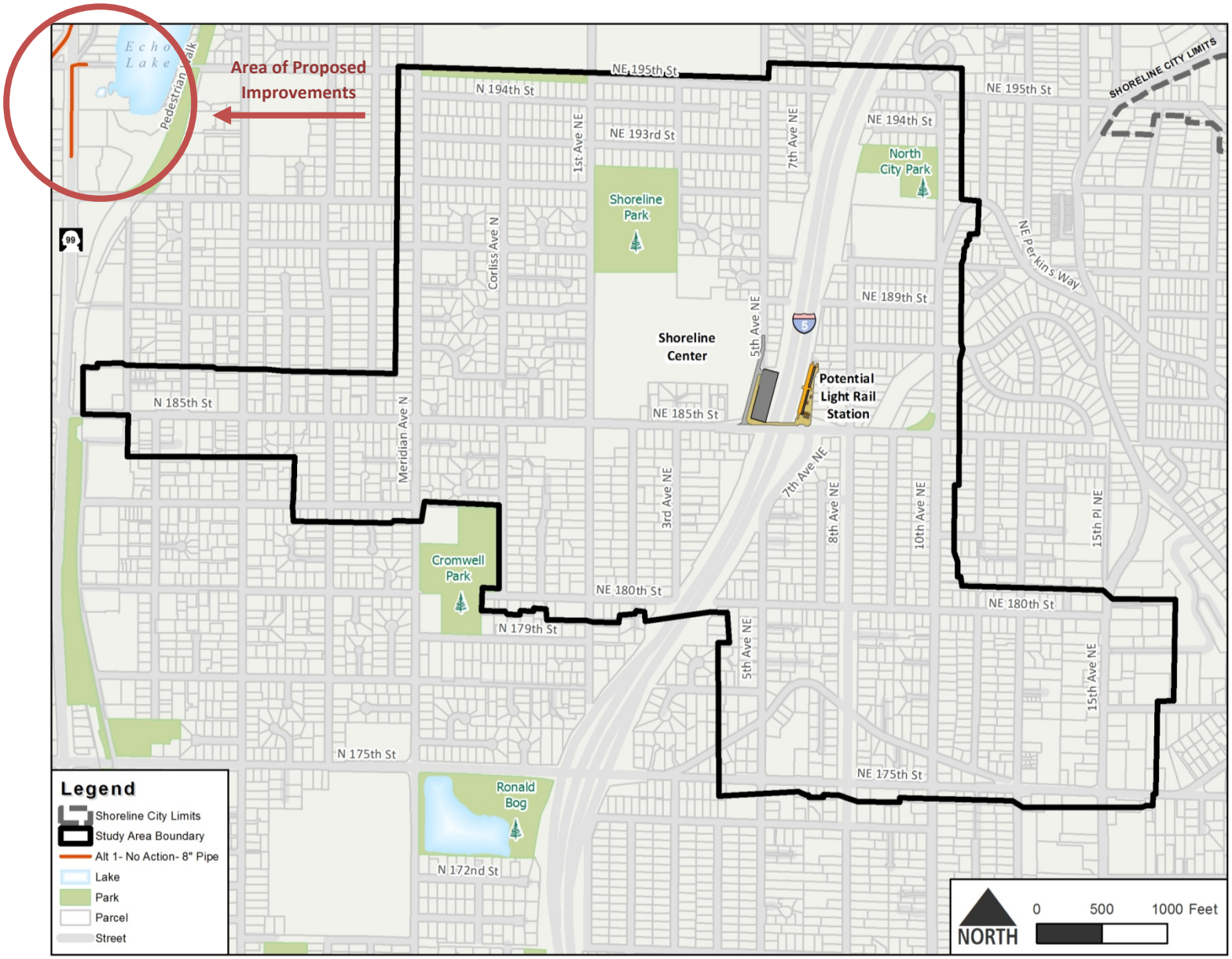


Figure 3.5-7 Planned Water Improvements in the Vicinity of the Subarea

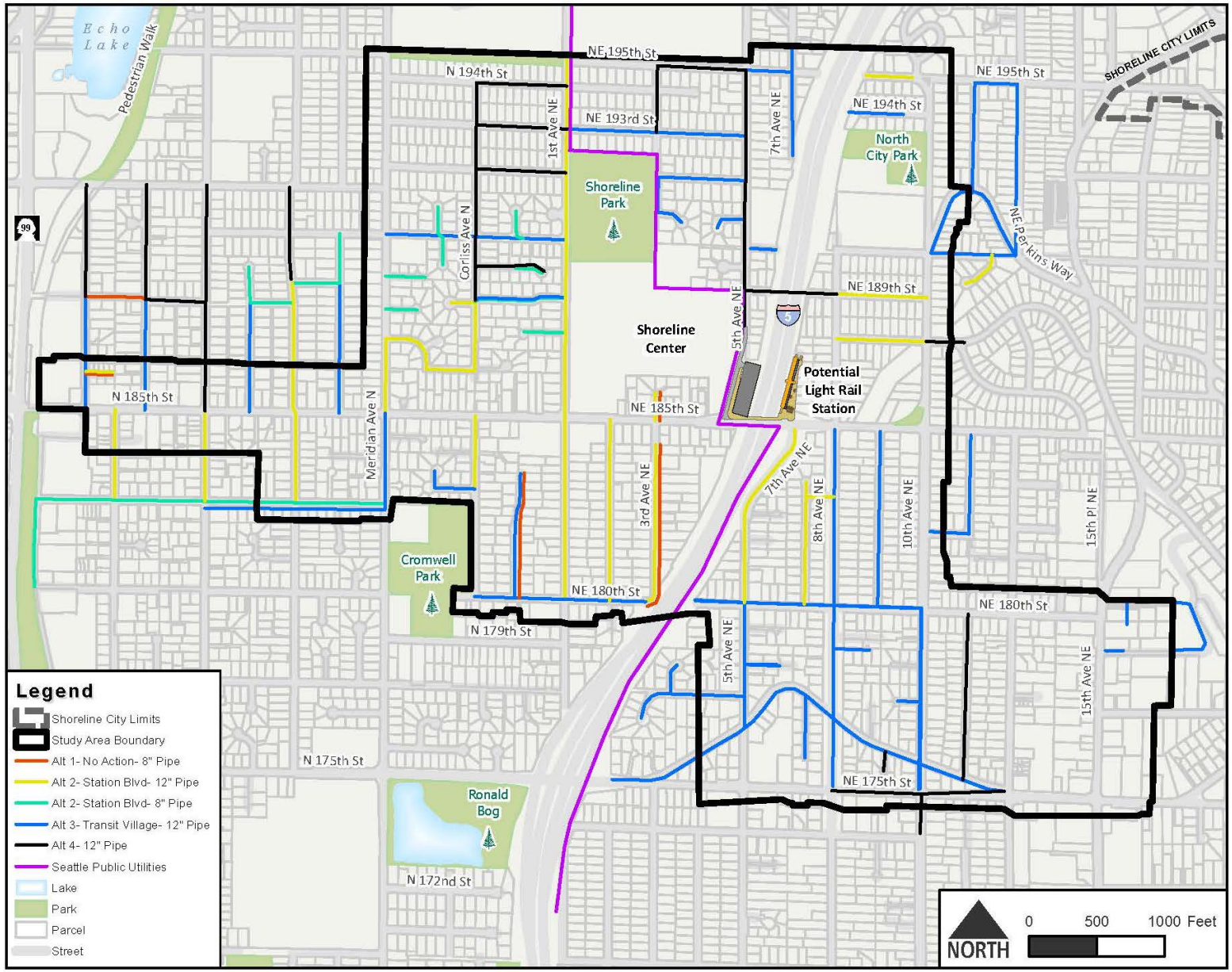


Figure 3.5-8 Other Recommended Future Water Improvements for Mitigation of the Action Alternatives

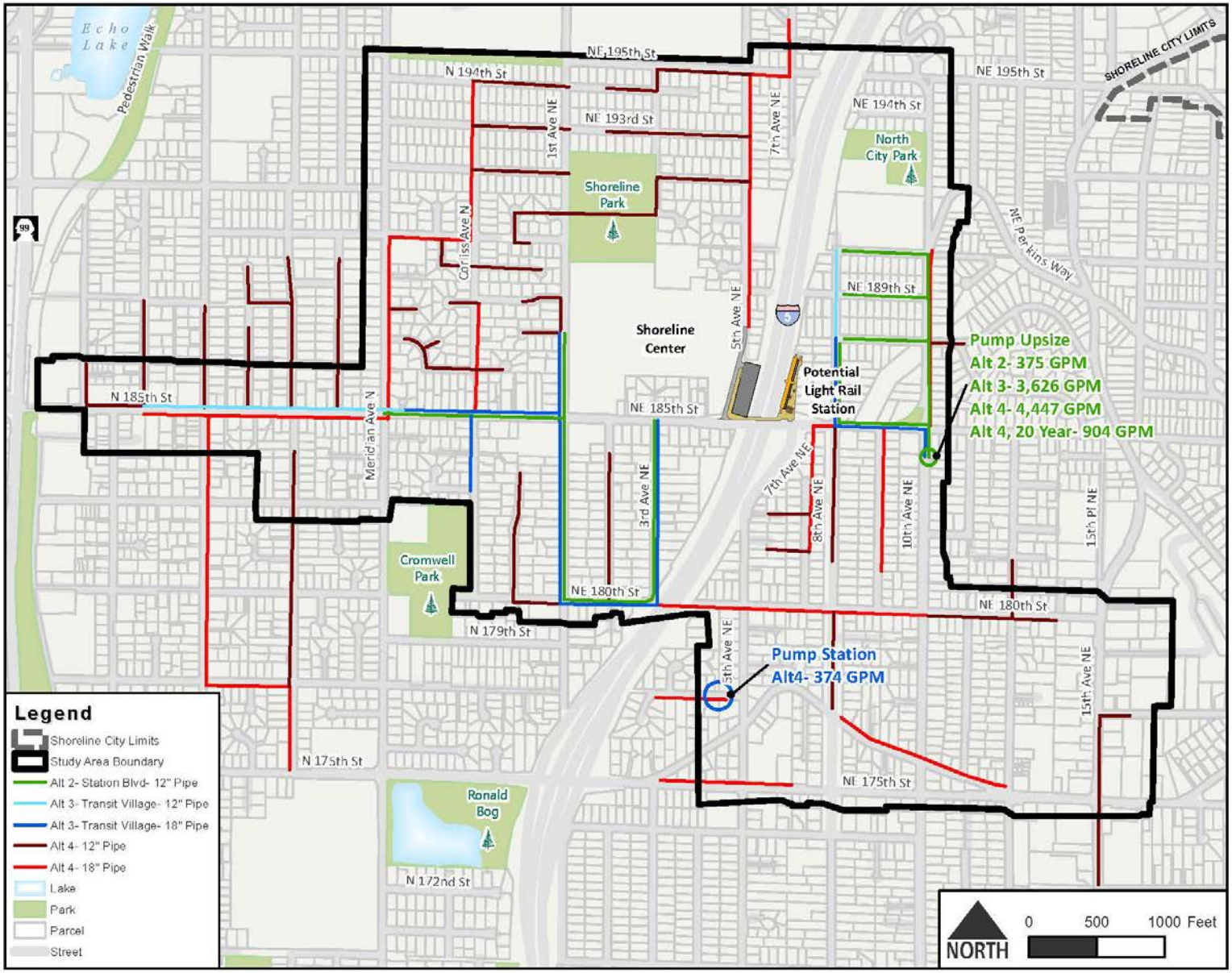


Figure 3.5-9 Recommended Future Wastewater Improvements for Mitigation of the Action Alternatives

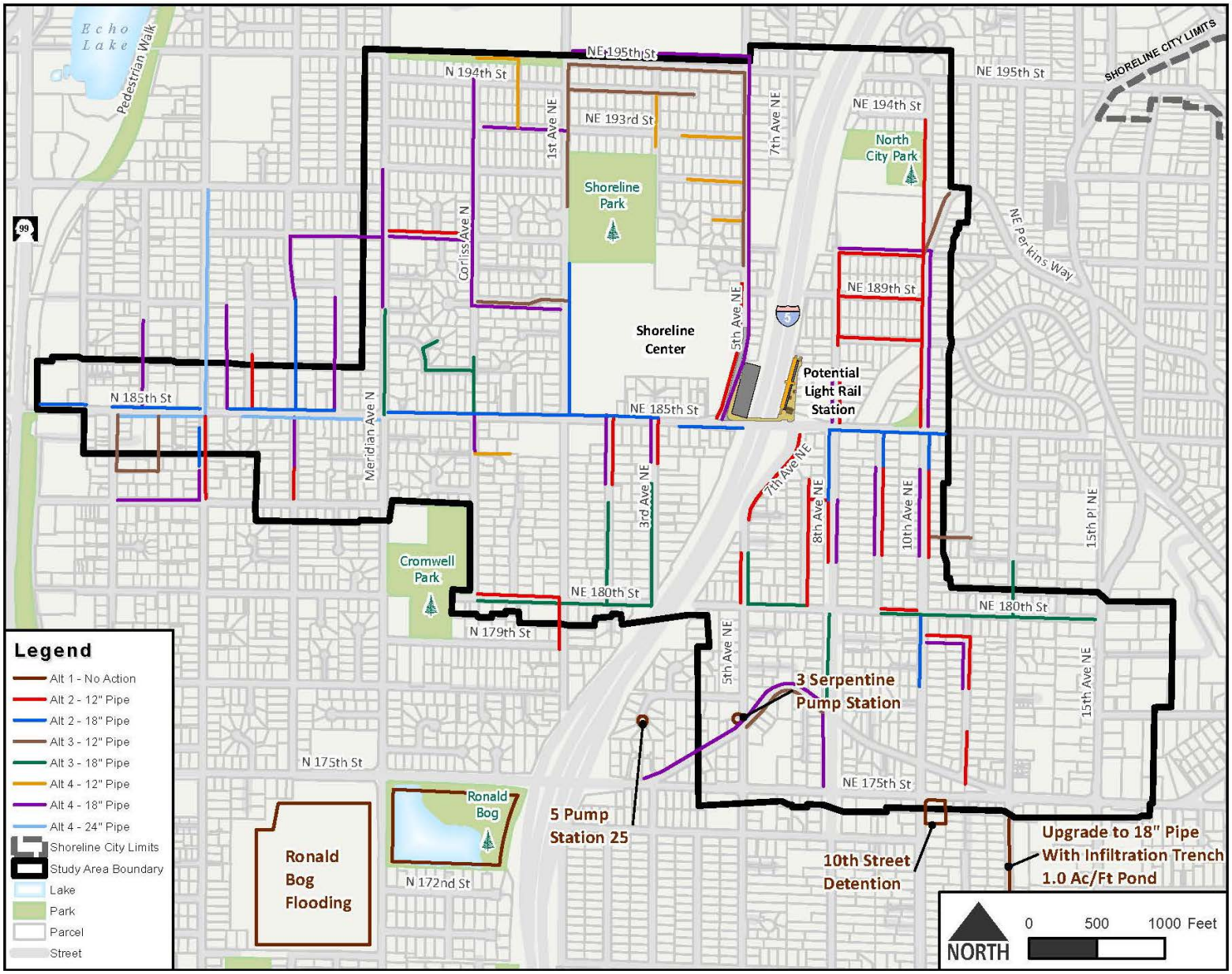


Figure 3.5-10 Planned and Recommended Surface Water/Stormwater Drainage Improvements in the Vicinity of the Subarea